An Address
ON
THE COMBATING OF TUBERCULOSIS IN THE LIGHT OF THE EXPERIENCE THAT HAS BEEN GAINED IN THE SUCCESSFUL COMBATING OF OTHER INFECTIOUS DISEASES.

Delivered at the Second General Meeting of the British Congress on Tuberculosis on July 23rd,

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THE task with which this Congress will have to busy itself is one of the most difficult, but it is also one in which labour is most sure of its reward. I need not point again to the innumerable victims tuberculosis annually claims in all countries, nor to the boundless misery it brings on the families it attacks. You all know that there is no disease which inflicts such deep wounds on mankind as this. All the greater, however, would be the general joy and satisfaction if the efforts that are being made to rid mankind of this enemy, which consumes its inmost marrow, were crowned with success. There are many, indeed, who doubt the possibility of successfully combating this disease, which has existed for thousands of years and has spread all over the world. This is by no means my opinion. This is a conflict into which we may enter with a surely-founded prospect of success, and I will tell you the reasons on which I base this conviction. Only a few decades ago the real nature of tuberculosis was unknown to us; it was regarded as a consequence, as the expression, so to speak, of social misery, and as this supposed cause could not be got rid of by simple means people relied on the probable gradual improvement of social conditions and did nothing. All this is altered now. We know that social misery does indeed go far to foster tuberculosis, but the real cause of the disease is a parasite—that is, a visible and palpable enemy which we can pursue and annihilate just as we can pursue and annihilate other parasitic enemies of mankind.

Strictly speaking, the fact that tuberculosis is a preventable disease ought to have become clear as soon as the tubercle bacillus was discovered and the properties of this parasite and the manner of its transmission became known. I may add that I, for my part, was aware of the full significance of this discovery from the first, and so will everybody have been who had convinced himself of the causal relation between tuberculosis and the tubercle bacillus. But the strength of a small number of medical men was inadequate to the conflict with a disease so deeply rooted in our habits and customs. Such a conflict requires the coöperation of many, if possible of all, medical men, shoulder to shoulder with the State and the whole population, and now the moment when such coöperation is possible seems to have come. I suppose there is hardly any medical man now who denies the parasitic nature of tuberculosis, and among the non-medical public, too, the knowledge of the nature of the disease has been widely propagated. Another favourable circumstance is that success has recently been achieved in the combating of several parasitic diseases and that we have learned from these examples how the conflict with pestilences is to be carried on. The most important lesson we have learned from the said experience is that it is a great blunder to treat pestilences according to a general scheme. This was done in former times. No matter whether the pestilence in question was cholera, plague, or leprosy, isolation, quarantine, useless disinfection were always resorted to. But now we know that every disease must be treated according to its own special individuality and that the measures to be taken against it must be most accurately adapted to its special nature, to its etiology. We are entitled to hope for success in combating tuberculosis only if we keep this lesson constantly in view As so extremely much depends just on this point I shall take the liberty to illustrate it by several examples.

The pestilence which is at this moment in the foreground of interest, the bubonic plague, may be instructive to us in several respects. People used to act upon the conviction that a plague patient was in the highest degree a centre of infection, and that the disease was transmitted only by plague patients and their belongings. Even the most recent international agreements are based on this conviction. Although, as compared with formerly, we now have the great advantage that we can, with the aid of the microscope and of experiments on animals, recognise every case of plague with absolute certainty, and although the prescribed inspection of ships, quarantine, the isolation of patients, the disinfection of infected dwellings and ships, are carried out with the utmost care, the plague has, nevertheless, been transmitted everywhere, and has in not a few places assumed grave dimensions. Why this has happened we know very well, owing to the experience quite recently gained as to the manner in which the plague is transmitted. It has been discovered that only those plague patients who suffer from plague-pneumonia—a condition which is fortunately infrequent—are centres of infection, and that the real transmitters of the plague are the rats. There is no longer any doubt that in by far the majority of the cases in which the plague has been transmitted by ocean traffic the transmission took place by means of plague among the ship rats. It has also been found that wherever the rats were intentionally or unintentionally exterminated the plague rapidly disappeared; whereas at other places where too little attention had been paid to the rat plague the pestilence continued. This connexion between the human plague and the rat plague was totally unknown before, so that no blame attaches to those who devised the measures now in force against the plague if the said measures have proved unavailing. It is high time, however, that this enlarged knowledge of the etiology of the plague should be utilised in international as well as in other traffic. As the human plague is so dependent on the rat plague it is intelligible that protective inoculation and the application of antitoxic serum have had so little effect. A certain number of human beings may have been saved from the disease by that, but the general spread of the pestilence has not been hindered in the least.

With cholera the case is essentially different; it may under certain circumstances be transmitted directly from human beings to other human beings, but its main and most dangerous propagator is water, and therefore in the combating of cholera water is the first thing to be considered. In Germany, where this principle has been acted on, we have succeeded for four years in regularly exterminating the pestilence (which was introduced again and again from the infected neighbouring countries) without any obstruction of traffic.

Hydrophobia, too, is not void of instruction for us. Against this disease the so-called protective inoculation proper has proved eminently effective as a means of preventing the outbreak of the disease in persons already infected, but of course such a measure can do nothing to prevent infection itself. The only real way of combating this pestilence is by compulsory muzzling. In this matter also we have had the most satisfactory experience in Germany, but have at the same time seen that the total extermination of the pestilence can be achieved only by international measures, because hydrophobia, which can be very easily and rapidly suppressed, is always introduced again year after year from the neighbouring countries.

Permit me to mention only one other disease, because it is etiologically very closely akin to tuberculosis, and we can learn not a little for the furtherance of our aims from its successful combating. I mean leprosy. It is caused by a parasite which greatly resembles the tubercle bacillus. Just like tuberculosis, it does not break out till long after infection and its course is almost slower. It is transmitted only from person to person, but only when they come into close contact, as in small dwellings and bedrooms. In this disease, accordingly, immediate transmission plays the main part; transmission by animals, water, or the like is out of the question. The combative measures, accordingly, must be directed against this close intercourse between the sick and the healthy. The only way to prevent this intercourse is to isolate the patients. This was most rigorously done in the Middle Ages by means of numerous leper-houses, and the consequence was that leprosy, which had spread to an alarming extent, was completely stamped out in Central

Europe. The same method has been adopted quite recently in Norway, where the segregation of lepers has been ordered by a special law. But it is extremely interesting to see how this law is carried out. It has been found that it is not at all necessary to execute it strictly, for the segregation of only the worst cases, and even of only a part of these, sufficed to produce a diminution of leprosy. Only so many infectious cases had to be sent to the leper-houses that the number of fresh cases kept regularly diminishing from year to year. Consequently the stamping-out of the disease has lasted much longer than it would have lasted if every leper had been inexorably consigned to a leper-house, as in the Middle Ages, but in this way, too, the same purpose is gained, slowly indeed, but without any harshness.

These examples may suffice to show what I am driving at, which is to point out that in combating pestilences we must strike the root of the evil and must not squander force in subordinate ineffective measures. Now the question is whether what has hitherto been done and what is about to be done against tuberculosis really strikes the root of tuberculosis so that it must sooner or later die. In order to answer this question it is necessary first and foremost to inquire how infection takes place in tuberculosis. Of course, I presuppose that we understand by tuberculosis only those morbid conditions which are caused by the tubercle bacillus In by far the majority of cases of tuberculosis the disease has its seat in the lungs, and has also begun there. From this fact it is justly concluded that the germs of the disease—i.e., the tubercle bacilli—must have got into the lungs by inhalation. As to the question where the inhaled tubercle bacilli have come from, there is also no doubt. On the contrary, we know with certainty that they get into the air with the sputum of consumptive patients. This sputum, especially in advanced stages of the disease, almost always contains tubercle bacilli, sometimes in incredible quantities. By coughing and even speaking it is flung into the air in little drops—i.e., in a moist condition—and can at once infect persons who happen to be near the coughers. But then it may also be pulverised when dry, in the linen or on the floor for instance, and get into the air in the form of dust. In this manner a complete circle, a so-called *circulus vitiosus*, has been formed for the process of infection from the diseased lung, which produces phlegm and pus containing tubercle bacilli, to the formation of moist and dry particles (which in virtue of their smallness can keep floating a good while in the air), and finally to new infection if particles penetrate with the air into a healthy lung and originate the disease anew. But the tubercle bacilli may get to other organs of the body in the same way and thus originate other forms of tuberculosis. This, however, is a considerably rarer case. The sputum of consumptive people, then, is to be regarded as the main source of the infection of tuberculosis. On this point, I suppose, all are agreed. The question now arises whether there are not other sources, too, copious enough to demand consideration in the combating of tuberculosis.

Great importance used to be attached to the hereditary transmission of tuberculosis. Now, however, it has been demonstrated by thorough investigation that though hereditary tuberculosis is not absolutely non-existent it is nevertheless extremely rare, and we are at liberty in considering our practical measures to leave this form of origination entirely out of account. But another possibility of uberculous infection exists, as is generally assumed, in the transmission of the germs of the disease from tuberculous animals to man. This manner of infection is generally regarded nowadays as proved and as so frequent that it is even looked upon by not a few as the most important, and the most rigorous measures are demanded against it. In this Congress also the discussion of the danger with which the tuberculosis of animals threatens man will play an important part. Now, as my investigations have led me to form an opinion deviating from that which is generally accepted, I beg your permission, in consideration of the great importance of this question, to discuss it a little more thoroughly.

Genuine tuberculosis has hitherto been observed in almost all domestic animals, and most frequently in poultry and cattle. The tuberculosis of poultry, however, differs so much from human tuberculosis that we may leave it out of account as a possible source of infection for man. So, strictly speaking, the only kind of tuberculosis remaining to be considered is the tuberculosis of cattle which, if really transferable to man, would indeed have frequent opportunities of infecting human beings through the drinking of the milk and the eating of the flesh of diseased animals. Even in my first circumstantial publication on the etiology of tuberculosis I expressed myself regarding the identity of human tuberculosis and bovine tuberculosis with reserve. Proved facts which would have enabled me sharply to distinguish these two forms of the disease were not then at my disposal, but sure proofs of their absolute identity were equally undiscoverable, and I therefore had to leave this question undecided. In order to decide it I have repeatedly resumed the investigations relating to it, but so long as I experimented on small animals, such as rabbits and guinea pigs, I failed to arrive at any satisfactory result, though indications which rendered the difference of the two forms of tuberculosis probable were not wanting. Not till the complaisance of the Ministry of Agriculture enabled me to experiment on cattle, the only animals really suitable for these investigations, did I arrive at absolutely conclusive results. Of the experiments which I have carried out during the last two years along with Professor Schütz of the Veterinary College in Berlin I will tell you briefly some of the most important.

A number of young cattle which had stood the tuberculin test, and might therefore be regarded as free from tuberculosis, were infected in various ways with tubercle bacilli taken from cases of human tuberculosis; some of them got the tuberculous sputum of consumptive patients direct. In some cases the tubercle bacillus or the sputum was injected under the skin, in others into the peritoneal cavity, in others nto the jugular vein. Six animals were fed with tuberculous sputum almost daily for seven or eight months; four repeatedly inhaled great quantities of bacilli, which were distributed in water and scattered with it in the form of spray. None of these cattle (there were 19 of them) showed any symptoms of disease and they gained considerably in weight. From six to eight months after the beginning of the experiments they were killed. In their internal organs not a trace of tuberculosis was found. Only at the places where the injections had been made small suppurative foci had formed, in which few tubercle bacilli could be found. This is exactly what is found when dead tubercle bacilli are injected under the skin of animals liable to contagion. So the animals we experimented on were affected by the living bacilli of human tuberculosis exactly as they would have been by dead ones; they were absolutely insusceptible to them. The result was utterly different, however, when the same experiment was made on cattle free from tuberculosis with tubercle bacilli that came from the lungs of an animal suffering from bovine tuberculosis. After an incubation-period of about a week the severest tuberculous disorders of the internal organs broke out in all the infected animals. It was all one whether the infecting matter had been injected only under the skin or into the peritoneal cavity or the vascular system. High fever set in and the animals became weak and lean; some of them died after from one and a half to two months; others were killed in a miserably sick condition after three months. After death extensive tuberculous infiltrations were found at the place where the injections had been made and in the neighbouring lymphatic glands, and also far-advanced alterations of the internal organs, especially of the lungs and the spleen. In the cases in which the injection had been made into the peritoneal cavity the tuberculous growths which are so characteristic of bovine tuberculosis were found on the omentum and peritoneum. In short, the cattle proved just as susceptible to infection by the bacillus of bovine tuberculosis as they had proved insusceptible to infection by the bacillus of human tuberculosis. I wish only to add that preparations of the organs of the cattle which were artificially infected with bovine tuberculosis in these experiments are exhibited in the museum of pathology and bacteriology.

An almost equally striking distinction between human and bovine tuberculosis was brought to light by a feeding experiment with swine. Six young swine were fed daily for three months with the tuberculous sputum of consumptive patients. Six other swine received bacilli of bovine tuberculosis with their food daily for the same period. The animals that were fed with sputum remained healthy and grew lustily, whereas those that were fed with the bacilli of bovine tuberculosis soon became sickly, were stunted in their growth, and half of them died. After three and a half months the surviving swine were all killed and examined. Among the animals that had been fed with sputum no trace of tuberculosis was found, except here and there little nodules in the lymphatic glands of the neck and in one case a few grey nodules in the

lungs. The animals, on the other hand, which had eaten bacilli of bovine tuberculosis had, without exception (just as in the cattle experiment) severe tuberculous diseases, especially tuberculous infiltration of the greatly enlarged lymphatic glands of the neck and of the mesenteric glands, and also extensive tuberculosis of the lungs and the spleen.

The difference between human and bovine tuberculosis appeared not less strikingly in a similar experiment with asses, sheep, and goats, into whose vascular systems the two kinds of tubercle bacilli were injected.

Our experiments, I must add, are not the only ones that have led to this result. If one studies the older literature of the subject, and collates the reports of the numerous experiments that were made in former times by Chauveau, Günther and Harms, Bollinger, and others, who fed calves, swine, and goats with tuberculous material, one finds that the animals that were fed with the milk and pieces of the lungs of tuberculous cattle always fell ill of tuberculosis, whereas those that were fed with human material did not. Comparative investigations regarding human and bovine tuberculosis have been made very recently in North America by Smith, Dinwiddie, Frothingham, and Repp, and their result agreed with that of ours. The unambiguous and absolutely conclusive result of our experiments is due to the fact that we chose methods of infection which excluded all sources of error, and carefully avoided everything connected with the stalling, feeding, and tending of the animals that might have a disturbing effect on the experiments. Considering all these facts, I feel justified in maintaining that human tuberculosis differs from bovine and cannot be transmitted to cattle. It seems to me very desirable, however, that these experiments should be repeated elsewhere in order that all doubt as to the correctness of my assertion may be removed. I wish only to add that, owing to the great importance of this matter, our Government has resolved to appointment a commission to make further inquiries on the subject.

But, now, how is it with the susceptibility of man to bovine tuberculosis? This question is far more important to us than that of the susceptibility of cattle to human tuberculosis, highly important as that is too. It is impossible to give this question a direct answer, because, of course, the experimental investigation of it with human beings is out of the question. Indirectly, however, we can try to approach it. It is well known that the milk and butter consumed in great cities very often contain large quantities of the bacilli of bovine tuberculosis in a living condition, as the numerous infection-experiments with such dairy products on animals have proved. Most of the inhabitants of such cities daily consume such living and perfectly virulent bacilli of bovine tuberculosis, and unintentionally carry out the experiment which we are not at liberty to make. If the bacilli of bovine tuberculosis were able to infect human beings, many cases of tuberculosis caused by the consumption of alimenta containing tubercle bacilli could not but occur among the inhabitants of great cities, especially the children. And most medical men believe that this is actually the case. In reality, however, it is not so. That a case of tuberculosis has been caused by alimenta can be assumed with certainty only when the intestine suffers first—i.e., when a so-called primary tuberculosis of the intestines is found. But such cases are extremely rare. Among many cases of tuberculosis examined after death I myself remember having seen primary tuberculosis of the intestine only twice. Among the great post-mortem material of the Charité Hospital in Berlin 10 cases of primary tuberculosis of the intestine occurred in five years. Among 933 cases of tuberculosis in children at the Emperor Frederick's Hospital for Children Baginsky never found tuberculosis of the intestine without simultaneous disease of the lungs and the bronchial glands. Among 3104 post-mortem examinations of tuberculous children Biedert observed only 16 cases of primary tuberculosis of the intestine. I could cite from the literature of the subject many more statistics of the same kind, all indubitably showing that primary tuberculosis of the intestine, especially among children, is a comparatively rare disease, and of the few cases that have been enumerated it is by no means certain that they were due to infection by bovine tuberculosis. It is just as likely that they were caused by the widely-propagated bacilli of human tuberculosis, which may have got into the digestive canal in some way or other—for instance, by swallowing saliva of the mouth. Hitherto nobody could decide with certainty in such a case whether the tuberculosis of the intestine was of human or of animal origin. Now we can diagnose the two. All that is necessary is to cultivate in pure culture the tubercle bacilli found in the tuberculous material and to ascertain whether they belong to bovine tuberculosis by inoculating cattle with them. For this purpose I recommend subcutaneous injection which yields quite specially characteristic and convincing results. For half a year past I have occupied myself with such investigations, but owing to the rareness of the disease in question the number of the cases which I have been able to investigate is but small. What has hitherto resulted from this investigation does not speak for the assumption that bovine tuberculosis occurs in man.

Though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is nevertheless already at liberty to say that, if such a susceptibility really exists, the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tuberculous cattle and the butter made of their milk as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it. So the only main source of the infection of tuberculosis is the sputum of consumptive patients and the measures for the combating of tuberculosis must aim at the prevention of the dangers arising from its diffusion. Well, what is to be done in this direction? Several ways are open. One's first thought might be to consign all persons suffering from tuberculosis of the lungs whose sputum contains tubercle bacilli to suitable establishments. This, however, is not only absolutely impracticable but also unnecessary. For a consumptive who coughs out tubercle bacilli is not necessarily a source of infection on that account so long as he takes care that his sputum is properly removed and rendered innocuous. This is certainly true of very many patients, especially in the first stages, and also of those who belong to the well-to-do classes and are able to procure the necessary nursing. But how is it with people of very small means? Every medical man who has often entered the dwellings of the poor, and I can speak on this point from my own experience, knows how sad is the lot of consumptives and their families there. The whole family have to live in one or two small, ill-ventilated rooms. The patient is left without the nursing he needs because the able-bodied members of the family must go to their work. How can the necessary cleanliness be secured under such circumstances? How is such a helpless patient to remove his sputum so that it may do no harm? But let us go a step further and picture the condition of a poor consumptive patient's dwelling at night. The whole family sleep crowded together in one small room. However cautious he may be the sufferer scatters the morbid matter secreted by his diseased lungs every time he coughs and his relatives close beside him must inhale this poison. Thus whole families are infected. They die out and awaken in the minds of those who do not know the infectiousness of tuberculosis the opinion that it is hereditary, whereas its transmission in the cases in question was due solely to the simplest processes of infection, which do not strike people so much because the consequences do not appear at once, but generally only after the lapse of years. Often under such circumstances the infection is not restricted to a single family, but spreads in densely inhabited tenement houses to the neighbours, and then, as the admirable investigations of Biggs have shown in the case of the densely peopled parts of New York, regular nests or foci of disease are formed. But if one investigates these matters more thoroughly one finds that it is not poverty *per se* that favours tuberculosis, but the bad domestic conditions under which the poor everywhere, but especially in great cities, have to live. For, as the German statistics show, tuberculosis is less frequent, even among the poor, when the population is not densely packed together, and may attain very great dimensions among a well-to-do population when the domestic conditions, especially as regards the bedrooms, are bad, as is the case, for instance, among the inhabitants of the North Sea coast. So it is the overcrowded dwellings of the poor that we have to regard as the real breeding-places of tuberculosis; it is out of them that the disease always crops up anew, and it is to the abolition of these conditions that we must first and foremost direct our attention if we wish to attack the evil at its root and to wage war against it with effective weapons. This being so, it is very gratifying to see how efforts are being

made in almost all countries to improve the domestic conditions of the poor. I am also convinced that these efforts, which must be promoted in every way, will lead to a considerable diminution of tuberculosis. But a long time must elapse ere essential changes can be effected in this direction, and much may be done meanwhile in order to reach the goal much more rapidly.

If we are not able at present to get rid of the danger which small and overcrowded dwellings involve, all we can do is to remove the patients from them and, in their own interests and that of the people about them, to lodge them better, and this can be done only in suitable hospitals. But the thought of attaining this end by compulsion of any kind is very far from me; what I want is that they may be enabled to obtain the nursing they need better than they can obtain it now. At present a consumptive in an advanced stage of the disease is regarded as incurable and as an unsuitable inmate for a hospital. The consequence is that he is reluctantly admitted and dismissed as soon as possible. The patient, too, when the treatment seems to him to produce no improvement and the expenses, owing to the long duration of his illness, weigh heavily upon him, is himself animated by the wish to leave the hospital soon. That would be altogether altered if we had special hospitals for consumptives, and if the patients were taken care of there for nothing, or at least at a very moderate rate. To such hospitals they would willingly go; they could be better treated and fed there than is now the case. I know very well that the execution of the project will have great difficulties to contend with, owing to the considerable outlay it entails. But very much would be gained if, at least in the existing hospitals, which have to admit a great number of consumptives at any rate, special wards were established for them in which pecuniary facilities would be offered them. If only a considerable fraction of the whole number of consumptives were suitably lodged in this way a diminution of infection, and consequently of the sum-total of tuberculosis, could not fail to be the result. Permit me to remind you in this connexion of what I said about leprosy. In the combating of that disease also great progress has already been made by lodging only a fair number of the patients in hospitals. The only country that possesses a considerable number of special hospitals for tuberculous patients is England, and there can be no doubt that the diminution of tuberculosis in England, which is much greater than in any other country, is greatly due to this circumstance. I should point to the founding of special hospitals for consumptives and the better utilisation of the already existing hospitals for the lodging of consumptives as the most important measure in the combating of tuberculosis, and its execution opens a wide field of activity to the State, to municipalities, and to private benevolence. There are many people who possess great wealth and would willingly give of their superfluity for the benefit of their poor and heavily afflicted fellow-creatures, but do not know how to do this in a judicious manner. Here is an opportunity for them to render a real and lasting service by founding consumption hospitals or purchasing the right to have a certain number of consumptive patients maintained in special wards of other hospitals free of expense.

As, however, unfortunately, the aid of the State, the municipalities, and rich benefactors will probably not be forthcoming for a long time yet, we must for the present resort to other measures that may pave the way for the main measure just referred to and serve as a supplement and temporary substitute for it. Among such measures I regard obligatory notification as specially valuable. In the combating of all infectious diseases it has proved indispensable as a means of obtaining certain knowledge as to their state, especially their dissemination, their increase, and their decrease. In the conflict with tuberculosis also we cannot dispense with obligatory notification; we need it not only in order to inform ourselves as to the dissemination of this disease, but mainly in order to learn where help and instruction can be given, and especially where the disinfection which is so urgently necessary when consumptives die or change their residences has to be effected. Fortunately it is not at all necessary to notify all cases of tuberculosis, nor even all cases of consumption, but only those that, owing to the domestic conditions, are sources of danger to the people about them. Such limited notification has already been introduced in various places—in Norway, for instance, by a special law, in Saxony by a Ministerial decree, in New York, and in several American towns which have followed its example. In New York, where notification was optional at first and was afterwards made obligatory, it has proved eminently useful. It has thus been proved that the evils which it used to be feared the introduction of notification for tuberculosis would bring about need not occur and it is devoutly to be wished that the examples I have named may very soon excite emulation everywhere.

There is another measure connected with notification—viz., disinfection, which, as already mentioned, must be effected when consumptives die or change their residence in order that those who next occupy the infected dwelling may be protected against infection. Moreover, not only the dwellings but also the infected beds and clothes of consumptives ought to be disinfected. A further measure, already recognised on all hands as effective, is the instructing of all classes of the people as to the infectiousness of tuberculosis and the best way of protecting oneself. The fact that tuberculosis has considerably diminished in almost all civilised states of late is attributable solely to the circumstance that knowledge of the contagious character of tuberculosis has been more and more widely disseminated and that caution in intercourse with consumptives has increased more and more in consequence. If better knowledge of the nature of tuberculosis has alone sufficed to prevent a large number of cases this must serve us as a significant admonition to make the greatest possible use of this means and to do more and more to bring it about that everybody may know the dangers that threaten them in intercourse with consumptives. It is only to be desired that the instructions may be made shorter and more precise than they generally are, and that special emphasis may be laid on the avoidance of the worst danger of infection, which is the use of bedrooms and small ill-ventilated workrooms simultaneously with consumptives. Of course the instructions must include directions as to what consumptives have to do when they cough and how they are to treat their sputum. Another measure, which has come into the foreground of late, and which at this moment plays to a certain extent a paramount part in all efforts for the combating of tuberculosis, works in quite another direction. I mean the founding of sanatoria for consumptives.

That tuberculosis is curable in its early stages must be regarded as an undisputed fact. The idea of curing as many tuberculous patients as possible in order to reduce the number of those that reach the infectious stage of consumption and thus to reduce the number of fresh cases was therefore a very natural one. The only question is whether the number of persons cured in this way will be great enough to exercise an appreciable influence on the retrogression of tuberculosis. I will try to answer this question in the light of the figures at my disposal. According to the business report of the German Central Committee for the Establishment of Sanatoria for the Cure of Consumptives, about 5500 beds will be at the disposal of these institutions by the end of 1901, and then, if we assume that the average stay of each patient will be three months, it will be possible to treat at least 20,000 patients every year. From the reports hitherto issued as to the results that have been acheived in the establishments we learn further that about 20 per cent. of the patients who have tubercle bacilli in their sputum lose them by the treatment there. This is the only sure test of success, especially as regards prophylaxis. If we make this the basis of our estimates, we find that 4,000 consumptives will leave these establishments annually as cured. But, according to the statistics ascertained by the German Imperial Office of Health, there are 226,000 persons in Germany over fifteen years of age who are so far gone in consumption that hospital treatment is necessary for them. Compared with this great number of consumptives the success of the establishments in question seems so small that a material influence on the retrogression of tuberculosis in general is not yet to be expected of them. But pray do not imagine that I wish by this calculation of mine to oppose the movement for the establishment of such sanatoria in any way. I only wish to warn against the over-estimating of their importance which has recently been observable in various quarters, based apparently on the opinion that the war against tuberculosis can be waged by means of sanatoria alone and that other measures are of subordinate value. In reality the contrary is the case. What is to be achieved by the general prophylaxis resulting from recognition of the danger of infection and the consequent greater caution in intercourse with consumptives is shown by a calculation of Cornet's regarding the decrease of mortality from tuberculosis in Prussia in the years 1889 to 1897. Before 1889 the

average was 31·4 per 10,000, whereas in the period named it sank to 21·8, which means that in that short space of time the number of deaths from tuberculosis was 184,000 less than was to be expected from the average of the preceding years. In New York, under the influence of the general sanitary measures directed in a simply exemplary manner by Biggs, the mortality from tuberculosis has diminished by more than 35 per cent. since 1886. And it must be remembered that both in Prussia and in New York the progress indicated by these figures is due to the first beginnings of these measures. Considerably greater success is to be expected of their further development. Biggs hopes to have got so far in five years that in the city of New York alone the annual number of deaths from tuberculosis will be 3000 less than formerly.

Now, I do indeed believe that it will be possible to render the sanatoria considerably more efficient. If strict care be taken that only patients be admitted for whom the treatment of those establishments is well adapted and if the duration of the treatment be prolonged it will certainly be possible to cure 50 per cent. and perhaps still more. But even then, and even if the number of the sanatoria be greatly increased, the total effect will always remain but moderate. The sanatoria will never render the other measures I have mentioned superfluous. If their number becomes great, however, and if they perform their functions properly, they may materially aid the strictly sanitary measures in the conflict with tuberculosis.

If now, in conclusion, we glance back once more to what has been done hitherto for the combating of tuberculosis, and forward to what has still to be done, we are at liberty to declare with a certain satisfaction that very promising beginnings have already been made. Among these I reckon the consumption hospitals of England, the legal regulations regarding notification in Norway and Saxony, the organisation created by Biggs in New York (the study and imitation of which I most urgently recommend to all municipal sanitary authorities), the sanatoria, and the instruction of the people. All that is necessary is to go on developing these beginnings, to test and, if possible, to increase their influence on the diminution of tuberculosis, and wherever anything useful has yet been done to do likewise. If we allow ourselves to be continually guided in this enterprise by the spirit of genuine preventive medical science, if we utilise the experience gained in conflict with other pestilences, and aim, with clear recognition of the purpose and resolute avoidance of wrong roads, at striking the evil at its root, then the battle against tuberculosis, which has been so energetically begun, cannot fail to have a victorious issue.

An Address
ON
THE PREVENTION OF TUBERCULOSIS IN THE DIFFERENT CIVILISED NATIONALITIES.

Delivered at the Third General Meeting of the British Congress on Tuberculosis on July 24th,

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MR. PRESIDENT, LADIES, AND GENTLEMEN,—Mortality from tuberculosis varies according to the country. In some cases it is accountable for a sixth, a fifth, and sometimes a fourth of the total mortality. Havoc such as this makes it compulsory that all nations and governments should strictly inquire into and adopt measures to arrest the propagation of a disease which in these days is the greatest enemy of the human race. The wonder is that the voice of alarm has been so long in making itself heard and that for centuries our ancestors have looked impassively on the disasters going on around them. There were several reasons for this apparent indifference. The struggle was considered useless, the disease incurable; it was not known how it spread. Exaggerating the import of some observations it was agreed that phthisis was hereditary. They were lulled to sleep by this formula which served as a pillow for idleness and exempted them from investigating the origin of the mischief. Popular observations were looked upon as old wives' tales—e.g., those of Morgagni, who in the seventeenth century stated that in Italy it was customary to burn the bedding of persons who had died from phthisis, and who declared that he was frightened to make a post-mortem examination on cases of phthisis.

But when, on Dec. 5th, 1865, Villemin showed experiments at the Academy of Medicine which proved the real presence of the contagion, when our illustrious colleague Professor Robert Koch had discovered and demonstrated to the medical world the agent of this contagion, everyone felt that a new way was opened to humanity and every nation wished to profit for the public good by the recent scientific discoveries. Before the men of science whom I have just mentioned had actually made known their discoveries, you English people had already begun the struggle. Convinced by observation that tuberculosis thrived in dark and damp dwellings, in 1836—nearly 70 years ago—you passed a law providing for the construction of healthy houses. And since that date your zeal has not abated. You have, with admirable perseverance, passed more than 10 Acts of Parliament, you have rendered salubrious the dwellings of the poor, the workshop, the town, and the whole kingdom. This effort has been described by the name of the Queen who presided over its direction—the Victorian Era. No greater homage could be paid to Her Gracious Majesty, and in the name of all my countrymen I unite with my English colleagues in adopting this characteristic name for the crusade that was undertaken and for the success obtained. You have diminished mortality in England from tuberculosis by 40 per cent. Yours is the honour. It will be ours to follow in your steps. I was asked by the committee to make the subject of my address the measures adopted by different nations for the prevention of consumption. This I agreed to do, but I must at the same time make a confession. I depended too much on my wish to please my excellent colleagues whose request seemed so feasible; but, unfortunately, precise information is difficult to collect, and the time at my disposal for its verification was very short, so that there will, I fear, be lacunæ, probably even errors. I shall be pleased in either case to have my attention drawn to them and I entreat my colleagues to do so; if they comply, thanks to them and to you the wish expressed by the committee will be carried out and every nation may, by hearing what its neighbours have done, gain instruction and be inspired by motives of emulation beneficial to all.

Gentlemen, the grounds for the prevention of tuberculosis are identical in every country. On this question the entire medical profession of the world is united. Tuberculosis is avoidable and curable. The methods used to bring this about are the same in all countries, but according to the impetus given to the movement by the men of science in the different nations and according to the customs and laws in force some nations have taken the first rank. Allow me, gentlemen, to dwell a moment on legislation. It is only possible to bring a law into force that interferes with our daily life, that disturbs inveterate habits, and that has to be carried out in the bosom of the domestic hearth, when it is called for by public opinion—when all are convinced of its benefits and everyone recognises the danger of his vicious habits and is ready personally to reform them and to require his neighbour to do the same. This is the state of things in England. This system seems to me the only efficacious one and the first thing which is indispensable is to educate public opinion. How is this *anti-tuberculous education* of public opinion to be carried out? You founded in England in 1899, under the presidency of His Royal Highness the Prince of Wales, a National Association for the Prevention of Consumption and other Forms of Tuberculosis. Its object is to carry out prevention by educating the masses. You drew up short, practical pamphlets. As a model I may quote "The Crusade against Consumption" (48 pages, price 6*d.*), "Milk and Tuberculosis," "Fresh Air and Ventilation," "How to prevent Consumption," &c., and distributed them freely. At the head of this association I find names that I recognise with respect—those of the gentlemen who inaugurated this Congress. Germany founded societies for the construction of sanatoria and then societies for the propagation of the idea, to popularise sanitary ideas. These societies are small and scattered in different localities, forming provincial groups. They, too, publish popular pamphlets.

In Belgium there is a national league against tuberculosis, with its seat in Brussels. Each province has an independent branch. In Norway the Storthing voted 40,000 crowns for the purpose of printing and distributing a popular work on tuberculosis by Dr. Klaus Haussen, and 2000 crowns to form a travelling fund for doctors wishing to gain information about the management of sanatoria. In France the Society for the Prevention of Tuberculosis by Popular Education, under the direction of Dr. Peyrot, has collected together those who can teach with authority. I refer to such men as Lavisse, Matignon, Victorien Sardou, Landouzy, &c. Many of us have addressed meetings explaining rules of prophylaxis in the provinces, where, on every hand, anti-tuberculous movements are springing up. I made use of my position as president of the Polytechnic Association to institute popular education in Paris. This year 88 lectures on tuberculosis have been given to 12,000 pupils of this association. Thus gradually in all countries the public are beginning to realise that personal care and cleanliness are necessary to obviate contagion, and are also realising that other idea, to my mind equally important, that a consumptive patient is only dangerous if the necessary precautions are not taken around him, and if he himself does not take them to protect his relatives, friends, and fellow-workmen from contagion.

Tuberculophobia must not be produced, the patient must not be made a pariah. Long before our time a consumptive person has lived for many months without contaminating wife and children. The danger is in the sputum, which contains thousands of contagious germs. To expectorate on the ground is a disgusting and dangerous habit. Once this habit has quite disappeared tuberculosis will decrease rapidly. What rôle, as a matter of fact, does this sputum play in the subsequent propagation of the disease? It varies in different cases. Collected and shut up in a private, or common but antiseptic, spittoon, destroyed by incineration or some other measure, it is dangerous to no one. Thrown into dry and well-lighted surroundings, exposed to the rays of the sun, it will soon lose its dangerous properties. But if it remains in damp and dark surroundings, it will maintain its activity for a long time. Thus it is that tuberculosis claims more victims from gloomy, ill-ventilated, dark dwellings. All nations have recognised this, but England has the double merit of recognising the primary importance of this problem and of having solved it successfully in a manner peculiarly her own. Recognising that insalubrious dwellings are one of the most potent agents in the propagation of tuberculosis, the legislations of the different countries have kept this cause of insalubrity well in view, and have made laws ordering the destruction of unhealthy dwellings. You, since 1836, have directed your legislation towards the construction of healthy abodes and this action on the part of the Government has led to the intervention of benefactors whose memory should be kept green in the minds of those interested in public health.

In Germany private initiative has not been so successful. Belgium has been one of the most enthusiastic nations in taking up the movement in favour of healthy dwellings. In Denmark building societies have flourished best of all. In 1600 Christian IV. set the example by erecting houses with gardens for the employés of his house. But if tuberculous germs fall in an ill-lighted, damp house they maintain their activity for a long time, whether the house is in town or country. In these surroundings population is often very dense. It is no uncommon thing to see one room in Paris occupied by five, six, eight, and sometimes 12 persons. They are continually coming in contact with one another, chances of contagion are increased by this fact alone, and in addition to the limited space has to be added the dirtiness of the occupants, or, as I should say, the impossibility of keeping sufficiently clean. Thus small tuberculous foci are created which invade the whole house; the workmen and employés carry the germs of disease into their workshops and offices and soon make a large tuberculous focus of the town. But I do not wish to mislead. A town is not *in toto* unhealthy. In the same town, quarters adjoining one another may have a mortality from tuberculosis which varies inversely; mortality from tuberculosis in districts in Paris varies from 10 to 100 per 10,000 inhabitants. However, in every quarter there are hotbeds of tuberculosis. These are what we have to find and to demolish. Above all else, new dwellings equally unhealthy must not be constructed, for they are a danger to a city and country. In most of the towns in all countries building plans of new houses have to be submitted for approval to the local sanitary authorities. It is a necessary precaution which cannot be too strictly enforced.

The evils of an unhealthy dwelling are not confined to the risk of contagion just referred to. The want of air and light acts on the nutrition of the inmates, children pine away, the strongest men cannot withstand it, every human being living in these places is the destined prey of infectious diseases; and if we only consider phthisis they become predisposing causes of consumption, transforming the strongest man and putting him on a par with the condition of those born of tuberculous parents. In the latter heredity is not direct, one is not born tuberculous, but predisposed to tuberculosis. The English, German, Italian, French, and other laws that I referred to a moment ago are therefore warranted, and should be enacted perseveringly, especially at a moment when there is a tendency in all countries to concentrate in the towns the greater part of the populations. By looking after the salubrity of the towns the health of the whole land is protected. Unhealthy dwellings cause other disasters. Dark and crowded as they are cleanliness is difficult, if not impossible, to preserve; they are not pleasant to pass the time in, and the workman stays in his home as little as possible; he eats there and sleeps there, but the rest of his time is spent in the public-house. J. Simon was right in saying: "The wretched lodging is the purveyor of the public-house," and we can add to it that the public-house is the purveyor of tuberculosis. In fact, alcoholism is the most potent factor in propagating tuberculosis. The strongest man who has once taken to drink is powerless against it. Time is too short for me now to draw comparisons between the laws in force in different countries—those which are proposed, private efforts, associated efforts, and temperance societies. But I can say that a universal cry of despair arises from the whole universe at the sight of the disasters caused by alcoholism. Any measures, State or individual, tending to limit the ravages of alcoholism will be our most precious auxiliaries in the crusade against tuberculosis, but the question is too large a one to deal with here. Still, I should like to draw attention to a mistake made too easily in the different countries by Ministers who have the charge of the financial department of the State. They like to calculate the sum which the State gets from the duty on alcohol, but they should deduct from it the cost to the community of the family of the ruined drunkard, his degenerate, infirm, scrofulous and epileptic children, who must have shelter. This invasion of alcoholism ought to be regarded by every one as a public danger, and this principle, the truth of which is incontestible, should be inculcated into the masses—that the future of the world will be in the hands of the temperate. The dangers surrounding a man in an unhealthy home are the same when for his work, his duties, his pleasure, through illness, or under constraint, a man lives all or part of the day in a centre where other people are assembled, where unhealthy conditions and overcrowding exist. If he is well, his companions are dangerous to him; if he is ill, he is dangerous to them. This peril from common life inseparable from advance in civilisation is continually growing: it is the penalty and accounts for the threatening increase in tuberculosis. Brought face to face with those predisposed by their family history, by the unhealthiness of their dwellings, it has been recognised as a duty in some countries to make an attempt to restore these tottering frames and to render them capable of baffling with the dangers that threaten them. It was adjudged with reason that childhood and youth would be the easiest period of life to influence. Thanks to the help of some towns and of private initiative in Italy and France and in other countries, sanatoria by the seaside have been established for weakly and scrofulous children. There are 14 in France which accommodate more than 2000 children a year, and with excellent results. May I be allowed to recall the fact that we owe this success chiefly to the unfailing activity and propaganda undertaken by our revered master, Dr. Bergeron. Inspired by the same idea, some countries have started holiday colonies and temporary visits to places by the sea or in the mountains. Everything done in this direction will help to rescue from contagion those who, thanks to the generosity of private individuals, can profit by these health-restoring visits. In 1893, with the same object in view, Madame Hervien started at Sedan working gardens for children, young people, and their parents. These gardens occupy more than 2000 square metres around the town, and accommodate 321

families composed of 1251 persons. The society supplies tools, seeds, and manure to each family. In 1894 the Jesuit Father Volpette started the working gardens at St. Etienne. They cover about 42 acres and accommodate 410 families, composed of 2460 persons. There are working gardens at Bercy and some are now being made at Fontainebleau and at Villeurbane, near Lyons.

Before touching on the question of the cure of tuberculosis I should like to say a few words about measures adopted to prevent tuberculous contagion by food. Since Chauveau showed that it was possible for tuberculous germs in food to produce tubercles in the intestinal tract attention has been turned to precautions for preventing the consumption of meats and milk from tuberculous animals. As far as meat is concerned, surveillance of the slaughter-houses in large towns achieves this. In Belgium this measure is also made to apply to the country, but I do not know of any other kingdom where private slaughter-houses are inspected, and in them it is that phthisical cows, measly pigs, and diseased animals of any kind are slaughtered, and are able to escape inspection. This injurious food is consumed either as fresh meat, or in the form of pâtés or sausages from which the tuberculous viscera have not been removed. Another danger is the hawking of meat in pieces. It is rife especially in the large towns. Butchers receive daily quarters of meat despatched by provincial butchers. This meat escapes inspection. With no wish to exaggerate the danger of the propagation of tuberculosis by meat it cannot be overlooked. It is easy by means of legislation to protect the population from this method of contamination. Belgium has set us the example.

That the milk of cows with tuberculous inflammation of the udder is used is very clear. Your great hygienist, the late Sir Richard Thorne, while pointing out that in England the mortality in general of adults from phthisis had diminished since 1850 from 45 per 100, regretted to see that from the same date infantile mortality from tuberculosis increased by 27 per 100. According to him this increase is entirely due to tuberculosis in the abdomen caused by ingestion of contaminated milk in infants under a year old; for in England cowhouses are not inspected. In France, to all appearances, the law allows this surveillance. It is entrusted to mayors, but to put the law into execution the mayors must know the cows suffering from tuberculous mammitis, and they can only know this if the owner reports it. Now the dairies only report their cows when their milk is dry, when, in fact, they are no longer dangerous to the consumers. It is well to add that in large concerns the milk from different sources is mixed, and one cow only need be the victim of tuberculous mammitis in order to contaminate all the milk with which its milk is mixed. To prevent this method of propagation measures of strict inspection should be adopted, such as have been in use for several years in Denmark, Sweden, and Norway to the great advantage of public health. Until such necessary measures are actually adopted there remains the simple mode of avoiding risk from milk by boiling it and this should be widely made known in spite of a too widespread prejudice which wrongly holds that boiled milk is less nutritious and indigestible.

If a man is the victim of tuberculosis everything possible should be done to cure him, for *he can be cured*. There is no doubt of this. From my personal experience at the Morgue in Paris, where I frequently make post-mortem examinations on accidental deaths, I can state that in half the cases, if the person on whom the examination is made has lived in Paris for about 10 years, I find healed tuberculous lesions, either in the form of cretaceous transformation or fibrous cicatrisation. I may add that it is quite certain that those on whom necropsies are held in almshouses, hospitals, and the Morgue, have certainly taken none of the precautions we consider necessary. In spite of often deplorably dirty habits the system has been strong enough to resist the ravages of the disease. These anatomical results have also another meaning. These lesions, in the majority of cases, are not phthisis in an early stage manifested by small disseminated foci; they are cicatrices of large foci, sometimes of wide, completely cicatrised cavities. Phthisis, therefore, is curable, even in its most advanced stages. This is maintained not only by anatomo-pathologists, but by all medical men who have made a special study of the disease. Grancher sums the matter up thus: "Tuberculosis is the most easily cured of chronic diseases."

As a tuberculous patient can be cured everything possible must be done to bring this about by careful organisation. The medical man being himself firmly convinced that his patient can be cured will make the necessary modifications in his way of looking at the disease. Formerly, when he thought that he could do nothing for a patient suffering from tuberculosis he had not the courage to tell the patient or his friends the nature of the disease. He considered it his duty to keep up appearances until the time came when the case was hopeless. Now that tuberculosis can be cured he can behave in just the opposite way. If it is true that in every stage tuberculosis can be cured it is certain to be true if the patient has been made to take the necessary precautions in the pre-tuberculous stage when lesions are very small and when there is sufficient power of resistance in the patient's system. The patient and his family should be told that he has a serious disease, but that it is curable. This change of demeanour in the medical man will only be possible when he is able to tell the patient the best scientific methods of treatment for him to use.

What are the best methods? How are they carried out in the different countries? In this address I am dealing only with the disease as it affects working men and employés. I am leaving out of the question well-to-do patients, though these may gain some idea from it of the rules to be observed. The remedies to be recommended vary according to the stage to which the disease has got, and also if the patient is single, married, or the father of a family. Three distinct periods may be defined. In the earliest the patient coughs and has a cold. What does he generally do? Either he takes no notice of it or he asks the chemist for a mixture for his cough. Days, weeks, and months go by, and if the weather is inclement he gets worse; if it is mild he has periods of being better, followed by more serious attacks. Then fever and wasting set in and he has to give up his work. He thinks illness has just begun. We know that he is entering the second stage, when even skilled treatment is probably useless. The first stage of the disease, therefore, interests us most, when intervention is of use. In what way can we be of use to a patient in the first stage?

In Germany there are polyclinics for tuberculosis in the large towns, where a medical man provided with the things necessary attends to the patients who come to consult him, either throughout their illness or till the patient can be admitted into a sanatorium. A committee, composed of benevolent men and women in large numbers, looks after the patient at home, tells his wife what to do, sees that his home is kept clean, and looks after necessary prophylactic measures. As far as possible the misery consequent on the bread-winner being out of work is relieved from a bank, kept up like the sanatoria banks, to assist such cases. M. Calmette conceived the same idea, but he went farther and advised that, instead of waiting for the workman to come for advice, they should go and meet him by inviting him to come to a dispensary run on the same lines as the German polyclinics. This is his own description of his project that he gave in 1899:—"Instead of waiting till the patient with tuberculosis comes to consult a doctor and is driven to give up his work I think that it would be better to establish the principle of going to him and offering him help before he finds out even that he is dangerously ill. I should like to be able to hunt out tuberculosis as soon as ever it has begun and to be able then and there to give the sufferer advice and the care necessary, while generally keeping him in his own family circle." M. Calmette has carried out his proposal; he opened an anti-tuberculous dispensary at Lille called Emile Roux, and it has been eminently successful. Dr. Bonnet has founded a similar institution in Paris, in the Montmartre quarter, and others are about to be established, one at Vaugirard, with municipal aid. Experience shows that workmen do not shun these dispensaries; some come because they have a cough, others because they know themselves to be attacked. As far as I can see the best way to ferret out disease would be to have one or more agent-workmen, foremen-workmen, if it were possible. They are the ones to notice when their comrades cough; they could advise them to go to the dispensary. Alive to the dangers of a badly kept workshop or yard they superintend its being kept clean and in order; they actually carry out anti-tuberculous education. Those who visit the dispensary receive the necessary attention from the medical men and are told the danger of dissemination by sputum, alcoholism, &c. They are looked after; they get meat gravy—one or two meals, as far as funds will allow. Their families are helped and their home is kept an eye on from the hygienic point of view; as far as possible the misery by which the

poor man is threatened is kept away from him. Among these patients some are found who must be sent to a sanatorium. If the patient is an unmarried man, and if he can be sent to a sanatorium, his chances of recovery are very great, but for a married man to go means that his wife and family must be provided for during his absence and his mind relieved of all anxiety on their account.

It is not my business to deal with the question of building and management of a sanatorium. We need only remember that they should be private, aseptic, disciplined, and worked on Dettweiler's principle—physical and moral rest, stuffing, and open-air treatment. In Germany this system has been carried out most enthusiastically through the assistance of private benevolence and municipal, industrial, and parochial aid; the State has generously supported the effort, recognising its value. In Germany there are 83 public sanatoria open or ready to open. They accommodate 12,000 patients a year. They have been built by local insurance, by sickness banks, by the manufacturers who have combined to found sanatoria for their workpeople, and by parishes which have united for the purpose. There are most of the latter. In some parts a tax of from a penny a head has been exacted. The State has founded several sanatoria for its servants; the forests department, railway department, and the State of Hamburg. The Commission of the Budget of the Reichstag decided to build State sanatoria under the control of the Ministry of the Interior. The treatment lasts at least 90 days, and experience has shown that it was good for the patients to spend another month in the year following recovery at the sanatorium. Under these circumstances how long do the patients keep better? Of those who leave the sanatorium in what is considered a satisfactory condition it has been shown that 46 per cent. in 1896, 47 per cent. in 1897, 58 per cent. in 1898; 60 per cent. in 1899 were able to work. The cost per head per patient for the three months' stay amounts to eight francs per diem, including the cost of assistance given to the patient's family, which is a third of the amount. Germany's example has been followed. England, Scotland, Australia, and Canada have erected some few sanatoria. In Austria Schrötter had the Sanatorium d'Alland built, with 300 beds. Chevalier von Kusy turned into small sanatoria some huts of the Ducke type. In the United States they set apart portions of hospitals to make consumptive wards of them. They made about 30 such small sanatoria. The Association of Alabama built one for prisoners, the Naval Department one for sailors. New York has actually six sanatoria. By the munificence of the Czar the Établissement Halila, in Russia, was built in 1897; and, since 1898, that of Tactzi, with two pavilions accommodating 20 beds for men and 20 beds for women. At Salta Princess Bariatinski has founded an establishment for schoolboys. The King of Sweden gave the sum collected at his jubilee (2,300,000 crowns) to build three sanatoria, Parliament voted 800,000 crowns for the same object, and the State gave the ground required for these three sanatoria. Denmark has already two sanatoria, and there is a scheme before Parliament for the erection of public sanatoria. Italy and the Netherlands and Norway have followed suit. In France several sanatoria have been opened: Hauteville, near Lyons; Agincourt, for Paris. Since 1876 we built the Home of Villepinte, and then that of Ormesson, for young tuberculous patients; and we may mention, in addition, the agricultural colonies of Cannet, the Jean Dollfus Home at Cannes, the Sanatorium of Gironde, that of Cimiez (near Nice), Argelez, and finally those which have recently been opened or will be—Lille, Nancy, Orléans, Versailles, Amiens, Le Havre, Marseilles, and (in Paris) the Bligny and Rouen sanatoria, &c. All nations have obeyed the same generous impulses, and the time will come when, instead of the poor tuberculous patient being given up to his sad lot, he will find if he is only in the first stage of the disease that by means of dispensaries and sanatoria there is always hope and often realisation of his recovery.

If the patient is beyond the first two stages when he asks for admission to the hospital, it must not be overlooked that he may still be cured, provided he can be made to see things as they are. He must be isolated in order that he may not be discouraged by the spectacle of his comrades' sufferings. Rules of isolation have been drawn up by Grancher and Thoinot for the patient and for his nurses; you have them in use in your own consumption hospitals. At Brompton in 20 years 15,000 consumptives have been cared for. No medical man or officer or nurse has been infected. This statement is supported by Dr. Williams, physician of the hospital, by Moeller, and by Masbrenier.

Gentlemen, when I was asked by the committee to tell you in my address, which I am sorry I could not make shorter, what steps had been taken by the different nations to carry out the crusade against consumption, I was also asked to consider the question from the international point of view. I do not think that it is possible to deal with consumption in this respect as plague, cholera, and yellow fever have been dealt with in order to prevent their being brought into a country. I do not know how any practitioner can state positively that a traveller at the frontier or the port is not consumptive. But it would be possible to take international steps in another way. Railway carriages might be disinfected as well as steamboats and hotels, and the traveller no longer exposed to germs of contagion. That would be of truly international import. The Minister or Public Works in France has recently sent a circular to railway companies calling their attention to the precautions necessary to obviate or to diminish risk from tuberculous contagion. In several countries, particularly in the United States, hotel-keepers who receive a consumptive client have to notify it to the municipal authorities, and compulsory disinfection of the room has to be gone through. The Minister of the Interior in Germany has brought in even more stringent measures. Every practitioner who attends a case of pulmonary or laryngeal tuberculosis is bound to report it in writing to the police as soon as he has made his diagnosis. After death from tuberculosis the room in which the patient has died has to be disinfected as have his belongings. Hotel proprietors, "furnished house" keepers, asylums, and other public institutions are compelled to notify at once every case of tuberculous disease which arises in their establishments. Notification, disinfection, salubrity of hotels, carriages, and steamboats are questions of an international character which might be advantageously dealt with by representatives of the different nations. The lesson to be drawn from the efforts that have been made by all nations to carry out a crusade against tuberculosis is that in conversation, in the public prints, and especially in prepared pamphlets, we should make it universally known that tuberculous contamination can be avoided, and that in addition the disease can be cured. Once convince our fellow citizens on these two points, and private initiative will be left behind; anti-tuberculous efforts, numerous now, will multiply and coördinate; parishes, provinces, and the State will not be able to stand aloof from a common effort, and we may reasonably prophesy that, united in one brave attempt, the whole civilised world will succeed in exterminating the cruellest scourge that has ever fallen on us, our children, and our friends, and which threatens the future of our countries.

Gentlemen, 10 years ago at the Congress of Hygiene in London, I spoke as follows:—"When at the beginning of a century one can inscribe the name of Jenner, and at its end that of Pasteur, the human race may rejoice; more has been done for it against misery, disease, and death than in any one of the centuries which have preceded it." All honour to the nineteenth century, but the century just begun, in its first year, sees the greatest effort that has ever been made in favour of public medicine. May no obstacle stand in our way, and may those who succeed us at the end of the twentieth century be able to bear witness that our conviction has not been fruitless and the results have answered the expectations of the nations that you, gentlemen of the Organising Committee, have brought together, with the highest and noblest motive that has ever animated the human race.

ROYAL ALBERT HOSPITAL, DEVONPORT.—The cost of carrying out the improvements in the Royal Albert Hospital, Devonport, has been heavier than was anticipated. Sir John Jackson has therefore given a donation of £500 to the building fund and the committee hope that further contributions will be received.

THE FALMOUTH DRAINAGE.—At the meeting of the Falmouth Corporation held on July 11th the General Purposes Committee recommended that a scheme of drainage, estimated to cost about £17,200, should be submitted to the Local Government Board for their approval, and application should be made to carry out the work. After a considerable discussion the mayor gave his casting vote in favour of the recommendation to adopt the scheme.

THE ADMINISTRATION OF THE MANCHESTER MILK CLAUSES, 1899.[1]

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THE evidence showing that tuberculous milk has been the cause of tuberculous disease demonstrated in the bodies of children who have died from tuberculosis or from other diseases is, from a variety of causes, rather scanty. Some evidence has, it is true, been collected to show that there is a disproportionately large amount of primary abdominal tuberculosis in young cattle, but no demonstration has been given that this is due to milk. Exact post-mortem examination records show that there is an almost complete absence of tuberculous lesions in new-born infants, while the proportion of children suffering from tuberculous lesions, abdominal and other, steadily increases with advancing months and years. Such records also show that primary abdominal tuberculosis is much more frequent in infants than in adults. It is open to infer that the food of young children and of young cattle is more liable to produce tuberculosis than the food of adults and of full-grown cattle. This is, however, only a probable conclusion. The conclusion is rendered much stronger by the evidence of feeding experiments, such as those made by Chauveau and Jöhne and repeated with milk from tuberculous udders for the Royal Commission on Tuberculosis (1895) by Dr. Sims Woodhead and Dr. Sidney Martin, which showed that the milk from tuberculous udders was virulently infective when fed to calves, kittens, pigs, and guinea-pigs. The Royal Commission were so much impressed by the evidence which they obtained on this subject that they recommended, *inter alia*, that for the purpose of excluding from their districts the milk of cows affected with tuberculosis of the udder or exhibiting clinical symptoms of the disease, local authorities should be given powers somewhat similar to those of sections 24–27 of the Glasgow Police (Amendment) Act, with power to slaughter such cows subject to compensation under the conditions named in the report.

In 1896, 1897, and 1898 a series of examinations of the cows within the city of Manchester and of suspected farms outside the city were made under the direction of the medical officer of health by the veterinary surgeon of the corporation, Mr. King, at first with a view to furnish evidence for the Royal Commission and subsequently to determine the lines which administrative action should take. In this preliminary work we are under a great obligation to Mr. Holburn, the present chief veterinary surgeon of the Markets Department, as well as for subsequent assistance. Professor Delépine undertook a careful investigation of the milks obtained from suspected udders and of the conditions to be observed in concluding that a particular milk was infectious. Professor Delépine had previously improved the inoculation test by showing that much increased accuracy and precision were obtained by inoculating guinea-pigs in the posterior limbs and obtained also other valuable results from his experimental investigations. Out of 10 samples of milk taken from indurated udders he found by microscopic examination and the inoculation test that only five were tuberculous. From this and other observations it was concluded that veterinary observations alone do not suffice to determine whether an udder is tuberculous, and our subsequent experience amply confirms this conclusion. In 1897 and 1898 20 samples taken at railway stations were found to be tuberculous by Professor Delépine, 16 of the corresponding farms were visited by Mr. King, and on 14 out of 16 he found cows having indurated udders. It was not then considered necessary to conclude the evidence by examining the milk from these udders, though this ought to have been done. Ample evidence, however, had been secured to show that valuable results could be secured by taking advantage of the recommendation of the Commission already quoted.

The Sanitary Committee of the city determined, in September, 1898, to apply for similar powers to those enjoyed by Glasgow. As originally drafted, the Manchester milk clauses sought unlimited power of inspection of the cows on all farms supplying milk to Manchester, and provided for the exclusion, temporary or permanent, of milk from all cows with udders affected with any disease, as well as of the milk from all cows affected with advanced tuberculosis. Other corporations followed the example, but the opposition at first was concentrated on Manchester, and the clauses were materially curtailed before they reached Parliament. It was found impossible from the beginning to insert a clause providing for the slaughter of cows suffering from tuberculosis of the udder, or from advanced tuberculosis, though the necessity for this clause was clearly recognised. It was further found necessary at a town's meeting to remove advanced tuberculosis as a condition rendering the milk of a cow unfit for human food. Hence the powers asked for by Manchester were not so large as those asked by some other corporations. The corporations applying for powers were advised by the Local Government Board that they would be much more likely to get powers from Parliament if they could agree on a common set of clauses, and Mr. Fitzgerald was requested to prepare a draft of clauses, which he did, with the aid of the Local Government Board. The opportunity was thus presented of inserting a clause relating to the slaughter of cows, but the absence of previous authorisation was fatal to the proposal. The common clauses were considered by the Local Government Board, the Board of Agriculture, and the Associated Chambers of Agriculture, and in their final form presented both additions to, and diminutions of, the powers asked for by the various corporations. The clauses enacted in effect:—1. That a cow known to be suffering from tuberculosis of the udder must be isolated, and by isolation was meant isolation on the same farm. 2. Powers were given to inspect the cows, and to take samples of milk from particular teats, also to take samples of mixed milk produced, or sold, or intended for sale within the city. These powers, however, can only be exercised outside the city on the production of an order of a justice having jurisdiction in the place in which the farm is situated. 3. If the medical officer of health is of opinion that tuberculosis is caused, or is likely to be caused, to persons residing in his district from consumption of the milk supplied from any dairy, the dairyman may be summoned to appear before the corporation to show cause why an order should not be made prohibiting him from supplying milk within the city. 4. A dairyman supplying milk within the city who has in his dairy any cow affected with, or suspected of, or exhibiting signs of, tuberculosis of the udder, shall forthwith give written notice of the fact to the medical officer of health of the district which he supplies, stating his name and address and the situation of the premises where the cow is. Unfortunately, the penalty attaching to an offence under this section must not exceed 40*s*.

The manner in which the administration was planned out before these clauses were obtained, and in which it has still been found most convenient to administer them, is as follows. Inside the city the cows are systematically examined and if any suspicious condition of the udder is discovered by its veterinary surgeon a sample of milk is drawn into a sterilised bottle sterilised in Professor Delépine's laboratory (full particulars being recorded), and is sent forthwith to him on its return to the office of the veterinary surgeon. If the milk is found to be tuberculous the cowkeeper is requested to have the cow slaughtered under veterinary inspection and does so.

It will be seen that this usually entails waiting a month till the result of the inoculation test is obtained. But in all cases with suspicious characters the cowkeeper is informed of the views of the veterinary surgeon. In the case of farms outside the city samples of mixed milk are taken from cans as they arrive at the railway stations or from milk-carts and are submitted to Professor Delépine for examination. Should he declare a sample to be tuberculous an order is obtained from a justice having jurisdiction in the place where the farm is situate empowering the medical officer of health or his deputy, accompanied by the veterinary surgeon of the corporation, to visit the farm, inspect the cows, and take samples of milk from suspected udders. These samples are then sent to Professor Delépine for examination and it is upon this examination that the diagnosis of tuberculosis of the udder is decided. The farmer is then required to isolate the affected cow, but is advised by the medical officer of health in writing to have her forthwith slaughtered in the presence of the veterinary surgeon of the corporation. How far this has been successful, how far unsuccessful, will be seen by the details shown in

[1] A paper communicated to the British Congress on Tuberculosis, Section I., State and Municipal.

the statement of the veterinary surgeon.[2] In all cases the cow has been disposed of, but the manner in which this has been effected clearly indicates the necessity for a clause requiring that the affected cow shall be slaughtered under supervision.

It will be noted that the detection of the tuberculous milk in the first instance, and the final diagnosis of the tuberculous udder, rest with the bacteriologist, and it might be supposed that the part of the veterinary surgeon is a somewhat subordinate one. This is by no means the case. The whole of the administration of these clauses, as carried out in Manchester, rests upon the assumption that, given a mixed milk proved to be tuberculous, there must be amongst the cows producing it one or more affected with tuberculosis of the udder. Exception might be taken to this assumption on these grounds: (1) that the milk may be contaminated by a consumptive person or otherwise in transit; (2) that it might be contaminated by tuberculous dust or dirt in the cowshed; and (3) that the milk might be infected by the presence in the cow of a generalised tuberculosis without the udder being affected. It is also conceivable as the result of fouling of the udder with infected excreta, without lesion of the udder.

With regard to (1) it is an almost inconceivable occurrence with a covered can, and all cans are covered and should be locked; (2) is a possibility in a highly infected cowshed, especially after it has been recently swept or if the affected cow is suffering from tuberculous disease of the intestines, but under ordinary conditions could hardly yield a sufficient number of bacilli to infect the milk to the extent determined by Professor Delépine; (3) may occur as a pathological rarity, but even then infection of the udder would have started. On the other hand, it does not follow that an udder which has been invaded by tuberculosis to an extent sufficient to yield an infected mixed milk shall present any lesions to clinical examination. Of this we were well aware before the milk clauses came into operation. In one such instance where I persuaded the cowkeeper to have his cows tested with tuberculin the udder of one cow gave a very marked local reaction, showing the presence of disease, though no morbid condition was found on clinical examination. On this fact, and on the well-known effect of tuberculin on local lesions, especially those of tuberculosis, was based our proposed use of the tuberculin test to determine, in advanced cases of tuberculosis, the condition of udders yielding no local signs. A reaction being obtained, it still remains necessary to examine the milk from the tuberculous udder to see whether it is tuberculous. The objection, then, urged against inferring from a tuberculous mixed milk the fact of one or more tuberculous udders being concerned in its production is scientifically of little value, and from the point of view of administration of none at all.

The fact that a mixed milk is tuberculous only serves to guide us in going to a particular farm, and if any flaw existed in our assumption this would mean only that the veterinary surgeon would not in all cases find tuberculous udders corresponding to the tuberculous mixed milk. Moreover, it has been quite clear, both to our veterinary surgeon and myself, that the power of detecting suspicious conditions in the udder is one which admits of considerable extension by practice, even in skilled hands, and it is in this difficult task that the important rôle of the veterinary surgeon lies. I am quite satisfied, from the udders which have been brought by Mr. Lloyd from slaughtered cows, that definite lesions are often so diffuse as to be most difficult of detection. Hence, when he states that he has seen three instances in which lesions, previously undetectable in udders yielding tuberculous milk, made their appearance during the continuance of his observations, I am prepared to accept the conclusion that the udder may be in a pathological condition, not to be discovered merely by manipulation, but quite adequate to produce in the milk large numbers of bacilli. As a result of following up 47 tuberculous milks he has found udders which were proved by subsequent examination of the milk to be tuberculous in 31 instances. In 15 instances a tuberculous udder has not been found. In one instance the result is not yet determined. In some cases the affected cows would appear to have been removed between the taking of the mixed sample and the subsequent visit of the veterinary surgeon to the farm. This might well happen, and by no means accidentally, but as a result of the milk being under examination. It is therefore highly satisfactory to find that in so high a proportion of cases the tuberculous udders have been traced. Such a result sufficiently proves our position that, given the mixed milk to be tuberculous, it is safe for all practical purposes to infer a tuberculous udder producing it. At the same time such a source of error and of misconduct need not exist. It would suffice to check it if all restriction on the inspection of outside farms were removed and if an additional veterinary surgeon were appointed to carry on such direct inspection. In case no tuberculous udder is found it suffices to subject the mixed milk to two or three further tests to determine whether this is due to an obscure udder condition or to some other cause. If it is due to obscurity of the diseased state of the udder the mixed milk will continue to be tuberculous. In some cases the condition of the atmosphere of the cowshed and the udders of the cows should be tested in regard of their power to infect the milk under existing and under possible conditions. This I propose to have done.

The "order" section of the milk clauses has not been used in Manchester, except in one instance where a cowshed was grossly overcrowded and incurably dirty. Yet this section gives very extensive powers, and possibly it is owing to the fact that it may be used that no one has attempted to use milk from a condemned cow. It is quite a conceivable policy to rely on the order section alone, and not to send a veterinary surgeon to the farm, throwing on the farmer the onus of determining how his milk has become infected and of showing that he had taken effectual steps to stop the production of tuberculous milk. Were such a policy adopted the farmer would be obliged to call in a veterinary surgeon at his own expense who would give him a certificate that he had taken the steps required by the clauses. The corporation would then satisfy themselves that the mixed milk from such dairy no longer contained tubercle bacilli and would doubtless refrain from making the order. The disadvantage of such a course would be that the sanitary authority would know nothing of the conditions under which milk was being produced, and it would also be a great hardship on the farmer to take this course. In the case of a dairy receiving and mixing milks from a number of farms this is the only course which could be adopted. It is quite evident that the order section would be most valuable in the case of persistent infection in a mixed milk when from one or another cause the source of the infection could not be ascertained. But we have had no such cases.

The clause requiring notification of suspicious conditions of the udder by farmers has been practically inoperative, directly. These conditions are not notified and the penalty is inadequate. But indirectly it has been of some service. When an udder has been shown to be tuberculous and a ready compliance is made with the request of the medical officer of health for the slaughter of the diseased cow in the presence of the veterinary surgeon no further action has been taken. But if the cow is removed, so that it cannot be satisfactorily traced, and if the udder has been such that notification ought to have been given, a prosecution ensues. In this roundabout manner some control is exercised over the disposal of the cows. But the penalty is inadequate, and a cow affected with tuberculosis of the udder should be forthwith slaughtered, under proper inspection, with a heavy penalty attached in case of evasion. I have indicated how these clauses have been carried out and how they might have been more severely administered, and the question presents itself whether their administration has been attended with a marked diminution in tuberculosis of the udder. If one might judge from the ferment which these clauses have excited one would expect that a considerable and steady diminution would have occurred. The diminution has been considerable, but it has by no means been constant. Of the mixed milks from 401 farms taken under the milk clauses 47 have proved tuberculous, or 11·7 per cent. Of 108 samples taken at railway stations before the milk clauses came into operation 20, or 18·5 per cent., were tuberculous. There has thus been an improvement in the milk samples taken at railway stations to the extent of 7 per cent., but the proportion of tuberculous udders has fluctuated. It may be that farmers supplying Manchester with milk will in future take additional precautions, and that a further improvement is only delayed. It was never anticipated that by these clauses tubercle bacilli would be altogether excluded from the milk-supply. The foundation of tuberculous udders remains behind in the tuberculous cows and in the dark, badly ventilated, and crowded cowsheds.

[2] Dr. Niven's paper was followed by a statement from Mr. J. S. Lloyd, M.R.C.V.S., late Veterinary Surgeon to the Sanitary Committee of the City of Manchester, which we shall publish later.

What was hoped, however, was that a substantial proportion of infection would be intercepted and that the irritation generated by the discovery of tuberculous infection would turn the attention of farmers to the necessity of protecting themselves, either by systematic veterinary inspection and greater cleanliness, or by getting the tuberculin test used towards the total eradication of tuberculosis.

It may be that we are in too much haste to gather our fruit, but I must admit that I begin to doubt whether the operation of the milk clauses is adequate to the entire result expected. On the other hand, one cannot but feel some degree of sympathy with farmers in hesitating to go in for entire eradication of tuberculosis, until at all events the necessary conditions are clearly understood by them. It is not sufficient to extirpate tuberculosis from a herd, as determined by the most careful application of the tuberculin test; as much care is requisite in the complete disinfection of the cowsheds, so that the herd should always be purified in summer in the first instance. It is also requisite that the cows should have adequate housing and that the cowsheds should be at all times kept thoroughly clean. It is difficult to provide a feeding passage and fulfil the latter condition with less than 700 cubic feet of space in a cowshed with one row of cows, unless the cows are stalled two and two, when 600 cubic feet may be just made to suffice, but double stalls are a bad arrangement.

Cows must be adequately fed. We have evidence that inadequate feeding greatly aids the spread of tuberculosis. Inadequate feeding is otherwise unprofitable and is often due to want of knowledge. It is well worth considering whether a herd newly purified from tuberculosis should not be turned into a grazing field not recently used. Wonderful as are the results of the tuberculin test it is not infallible even when applied legitimately; and supposing one or two tuberculous cows are introduced into a herd housed in dark, crowded, badly-ventilated, and dirty cowsheds, the disease will spread or else the whole of our conceptions regarding the propagation of tuberculosis are erroneous. If, however, the cows and cowsheds are kept rigidly clean an odd tuberculous cow should not matter much. But this condition cannot be fulfilled with many of our existing cowsheds, and if it could it is difficult to convey to a farm-labourer a sense of its supreme importance. Nevertheless, until we are ready to adopt the measures requisite for the complete eradication of tuberculosis from dairy cattle I agree with Professor Delépine that we shall not cease to have a certain proportion of tuberculous milks. Meantime we are content to wait for a year or two until we see how far the milk clauses will assist us. I would, however, urge these points: (1) that cows shown to suffer from tuberculosis of the udder should be required by law to be forthwith slaughtered in the presence of the veterinary surgeon employed under the milk clauses; (2) that all restrictions on the inspection of herds supplying the district with milk should be removed; and (3) that a heavy penalty should be attached to failure to notify suspicious conditions of the udder.

STERILISATION AND PASTEURISATION *v.* TUBERCLE-FREE HERDS, &c.[1]

BY E. W. HOPE, M.D. EDIN.,
MEDICAL OFFICER OF HEALTH OF THE CITY AND PORT OF LIVERPOOL.

ONE of the dangers of the tuberculous infection of human beings arises from the consumption of raw milk taken from cows which are themselves suffering from tuberculosis—notably tuberculosis of the udder. The object of the discussion which I have been asked to open is to determine which of three methods suggested furnishes the most practicable and the best safeguard against this danger, always bearing in mind that if we decide to rely upon one and are in a position to apply it with certain effect we shall not necessarily exclude the others, unless we can be assured that in doing so we are not, whilst effecting security from one danger, discarding safeguards against others even more serious. It is obvious that numerous points are involved in the subject, some of which are difficult to dissociate from questions other than those which concern tuberculosis only. For example, measures taken with the sole object of checking an even more destructive form of disease—viz., diarrhœa—have proved incidentally a safeguard against tuberculosis; while, on the other hand, measures directed against tuberculosis have afforded a valuable protection from other forms of disease. We must look at the subject from the wide view of general sanitation, remembering for the moment that there are other evils to be conquered as well as tuberculosis, and also bearing in mind that communities, like individuals, in their efforts to free themselves from mischief may be doing harm to those of their neighbours who are less able to take care of themselves. In the remarks that I am about to make, and for the purposes of this paper, I shall take it for granted that the phrase, "properly cooled between the time of milking and the time of reaching the consumers," implies also cleanliness and all other sanitary requirements except those specifically directed against tuberculosis; and, furthermore, my observations will be restricted to those aspects of the subject which most concern the large centres of population.

The terms "sterilisation" and "pasteurisation," so far as the subject under consideration is concerned, have practically the same significance—viz., raising the temperature of the milk to a degree which is capable of destroying the tubercle bacillus; exposure to a temperature of from 170° to 180° F. for about from 20 minutes to half an hour is sufficient to destroy most pathogenic organisms. However, sterilisation and pasteurisation of milk possess one conspicuous advantage—viz., that the application of the safeguard is within the reach of every reasonably prudent and careful household, consequently for ease of application it is beyond any comparison with the other preventive measure to be considered. The objections to it do not appear to be important, but there are the facts to be reckoned with that in the lower quarters of every great town there are thousands of families neither prudent nor careful, and also that the population of this country as a rule prefer to take their milk raw. This preference results, no doubt, partly from thoughtlessness and partly from habit. Young children are trained to take it raw, and the belief is widespread that if the milk is raised in temperature to, say, 200° F., or even still nearer the boiling point, it is altered in flavour and constitution and is of less nutritive and digestive value than when it is given raw; the raw milk, in fact, is regarded as more nearly approaching the natural milk of the mother.

There is no clinical evidence whatever to shew that sterilised or even boiled milk is less nutritious and valuable than raw milk. On the other hand, raw cows' milk, in addition to the risk of tuberculosis, brings many others. The process of milking may involve dirt from a dirty milker, from dirty udders into a dirty milk pail. From this it may be passed through a dirty strainer into a dirty railway-can. It is discharged from the railway-can into smaller vessels in which it is hawked about the dusty streets, passing through some half-dozen other pots and pans before it reaches the nursery or the table of the consumer, involving a host of possible sources of contamination, not excepting the contamination of tubercle bacillus; in fact, it may be safely said there is no article of food in common use so constantly exposed to contamination or so suceptible of contamination as raw milk. The milk, on the other hand, as nature intended it to be given, is never once exposed to air, passing directly and at the time of its manufacture in the gland to the stomach of the young animal, and, apart from the possibility of disease in the gland, is bacteriologically clean and pure.

Sterilisation, valuable as it is as a final safeguard against tuberculosis, is, after all, only an expedient, and must not be put into so much prominence that the importance of the other safeguard is lost sight of, although we cannot take it for granted in considering the merits of different methods that essential accessories common to them all will be observed. The one merit of sterilisation is that it is an expedient easy of application and presenting few administrative difficulties. Beyond any question the ultimate advantage lies in obtaining the milk from herds free from tuberculosis. It is, in fact, comparable with the advantage of obtaining drinking water from a pure source instead of taking it from a contaminated one and relying upon purification afterwards. The first aim must be to ensure that the source of the milk is pure—in other words, that the cows are free from tuberculosis; or if this, under existing conditions of the law and public opinion, is unattainable, that they shall at least be free from any tuberculous disease of the udder or any tumour or condition of the udder simulating tuberculous disease, or, having regard to difficulties in diagnosis, we may with advantage go

[1] A paper communicated to the British Congress on Tuberculosis. Section I., State and Municipal.

even a step further and demand that the udder in all cows from which milk is taken for human food shall be in a perfectly normal condition.

The main causes of tuberculosis in cows are notorious: close confinement in ill-ventilated, badly-lighted, ill-constructed and dirty cowsheds—defects all as easy to remedy as is removal from the cowshed of the obviously tuberculous animal before it can cause infection of the rest. In the city of Liverpool about 26,000 gallons of milk are consumed every day; one-half of it comes from cows (about 6000 in number) kept within the city, the other half comes from cows kept in the country and is sent in by rail. Within recent years that part of the milk-supply which comes from cows kept within the city has been practically free from tuberculosis. This has been brought about by the sanitation of the cowsheds, adequacy of air, light, and cleanliness, by systematic and frequent inspection of the cows by qualified inspectors with veterinary help, and by frequent bacteriological analysis of the samples of milk; these are the measures which have effected this end. I do not say that out of the 6000 cows in the city there is not a single one affected with tubercle, but merely that there are few with such form of tuberculous disease as would be likely to contaminate the milk-supply.

These methods and this system of inspection were not initiated without difficulty and opposition. There is no opposition now; every person acquiesces in advantages which have been gained. But there is another aspect to the question. Only one-half of the quantity of milk consumed in Liverpool is supplied from the city, the remaining half comes from the country districts. But surely, it may be said, if the cows kept in the cowsheds within a great and populous city are healthy, those coming from the sunny meadows of the country, with their fertile pastures and ample land, are free also. Unfortunately, experience does not bear this out; the milk sent in from the country is more frequently tuberculous. Thus, out of 422 town samples examined during 1899 and 1900 five were tuberculous, being less than 1 per cent.; but out of 490 country samples taken during the same period 20 were tuberculous, being a trifle over 4 per cent. How can we protect ourselves against this? A special Act of Parliament applying to a few great towns, including Liverpool, gives special powers to exclude from the city, under a penalty, the milk coming from the country cowsheds in which tuberculous cows are kept under dirty and insanitary conditions. But if it is difficult to deal with and to supervise the supply within our own city, it is evidently both costly and difficult to maintain a staff to send under the special Act of Parliament to the insanitary and tubercle-ridden cowsheds of the country cowman, but having overcome these difficulties the broad national question comes in, for although we succeed in protecting ourselves what happens with regard to the diseased cows and the diseased milk? The dealer refrains from sending diseased milk to the protected city, but what is there to prevent him from sending his milk for sale and consumption to a district where no special Act of Parliament exists to enable the community to protect itself or from selling his diseased cows to a dairyman in another locality? This is not the way to secure a supply of milk from herds free from tuberculosis, but there can be little doubt that the action of the great cities will not only protect themselves but will to a certain extent protect the country districts also and will strengthen the hands of rural sanitary authorities. No doubt the great cities are financially better able to protect themselves; they have their larger and more costly staff, they have their bacteriological laboratories, their veterinary and medical officers, but at best they are but valuable allies to the rural sanitary authorities, and these, after all, must take their own action, since the protection the cities afford them is an indirect vicarious one and, as in cases which I have alluded to, there is nothing to prevent the cowkeeper from sending his diseased produce to rural districts after he has been prohibited from sending it to the great cities. Furthermore, the undoubted decline in the proportion of tuberculous milk sent in from the country may really mean that a larger proportion is consumed elsewhere. The subject is quite important enough for a Government department—e.g., the Local Government Board—to take in hand and appoint a special staff to supervise the milk-supply and all appertaining to it throughout the country.

I have no hesitation whatever in saying that it is quite possible to ensure that the milk-supply shall come from cows free from tuberculosis. Difficulties from ignorance, obstruction, and active opposition may be taken for granted, but these must be overcome, and the cowkeeper will learn in time that his own interests are identical with those of his customers, and by keeping healthy cows in a sanitary condition he will be a gainer in every way. It is only right to say that during last year samples of milk taken at the railway stations on arrival from the country do not appear to be more frequently tuberculous than the samples taken from the town. This may indicate one of two things: either a general improvement in the country cowsheds under the stimulus of city action, or, as in more cases than one which have come under my notice, dairymen who have been detected in sending in tuberculous milk have refrained altogether from sending milk to Liverpool and now send their milk elsewhere. These are points not to be lost sight of.

NATURAL IMMUNITY FROM TUBERCULOSIS IN NATAL, SOUTH AFRICA.[1]

BY JAMES F. ALLEN, M.D. R.U.I.,
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SITUATION, TOPOGRAPHY, AND CLIMATE OF NATAL.

IN considering the means whereby the disease known as "tuberculosis" may be repressed climatology must always take an important place, it being a matter of common notoriety that in certain parts of the world, under certain conditions of climate, topography, and social relations, this disease is a scourge which almost threatens the existence of the human race; and again in other regions, and under different circumstances, it seems to have lost its power of injuriously affecting man, though in some degree it may be known to exist locally. How the human race can exist in any country where this disease is known also to be, and be practically free from its affects, is a question so interesting, important, and instructive that every effort should be made to explain such immunity. For what is a natural mode of defence in one country may be artificially produced in another, or at least so nearly approached as to give great protection; and by the knowledge thus obtained those predisposing causes and circumstances which favour its propagation can be lessened or removed. The evidence, therefore, of anyone who has practised the medical profession, and who has lived for many years in a land so favoured, with reference to this disease, that nature has made it practically innocuous there, and who has at the same time had considerable clinical experience not only in general practice but in the charge of a public hospital should be of some service in this inquiry. I have lived in Pietermaritzburg, the capital of Natal, for 26 years, and during the whole of that time I have been in charge of its public hospital, known as Grey's Hospital. I have also been the greater part of that time medical officer to the corporation of Pietermaritzburg and have thus been brought into intimate relations with all sections of its inhabitants and have had its local conditions, socially and physically, constantly under consideration with reference to public health.

Pietermaritzburg is situated in the middle of the colony, about 40 miles from the sea in a direct line, at an altitude of 2200 feet. It is built at the foot of the southern spur inclosing the Zwaart Kop valley and is therefore in a very dry and sheltered situation. Its population numbers 30,000 of whom about half are coloured and consist of natives (that is, Zulu Kaffirs), Indians, and people of mixed races, the other half being Europeans. This city has nominated me its delegate to this Congress. Having thus presented my credentials I will proceed to describe the climate and topography of Natal and attempt to show how local conditions have modified the severity of tuberculosis in that colony.

Natal is part of south-eastern Africa, somewhat diamond-shaped, having a coast line of about 200 miles north of St. John's river and an area of about 20,851 square miles. It has a mixed population, being made up of 60,000 Europeans, 1,000,000 Zulus, and 50,000 Indians. Three such races, wholly dissimilar in habits, origin, and religion, present a diversified field for observation with reference to the prevalence of any disease and cannot but be instructive with regard to tuberculosis, from which deductions possibly can

[1] A paper communicated to the British Congress on Tuberculosis-Section II., Medical, including Climatology and Sanatoria.

be made as to what locally tends to check the disease and what common boon these totally different races enjoy which appears to give each an immunity from its attack.

Natal is the last portion of healthy South Africa east of the Drakensberg range. The healthiness of the eastern coast of Africa, from Cape Town to where Natal ends, depends upon the situation of the Drakensberg mountains. This range begins at Table Mountain behind Cape Town and as a guardian to human health ends at St. Lucia Bay in Zululand. After it passes St. Lucia Bay the range extends far north into the continent of Africa, but from St. Lucia northwards it ceases to be a factor in the preservation of health as far as human beings are concerned; indeed, it becomes a potent means of rendering the country almost uninhabitable to Europeans, thus forming a vast region where wild and savage beasts may be preserved, to await their own epoch for disappearance. Be that as it may, the Drakensberg range from Cape Town to St. Lucia Bay secures a good climate to that portion of the African continent and defends it from malaria. But north of St. Lucia Bay it causes such a condition of soil-saturation as to form a developing ground for the parasite of malaria, of such vast extent as to render hopeless all human means of making it healthy. That the same mountain range should be the guardian of health in one region and in another be the cause of the country being almost uninhabitable needs some explanation; and as it will help to throw more light on the physical features and condition of the healthy district which I am considering some further reference must be made to it. The Drakensberg range from Table Mountain at Cape Town runs north-east, following the coast line to St. Lucia Bay for a distance of nearly 1000 miles, the last 200 of which form Natal. At St. Lucia Bay the mountains tend to the west, leaving the coast and gradually drawing inland, having an ever-increasing plain between the foot of the mountains and the sea. The result of this configuration is roughly to divide the eastern littoral of Africa into healthy, non-malarial, and unhealthy, malarial districts, St. Lucia Bay being the dividing point.

During the spring and summer, on the eastern coast of Africa, from Port Elizabeth northwards, the south-west wind blows on to the land, laden with moisture from the ocean; and it is from this source that Natal receives its plentiful supply of rain from October to May, which cools and fertilises the country, keeps it healthy, and renders it a suitable place for European settlement. On the other hand, it is also this rain-laden wind which, north of St. Lucia Bay, makes Africa, by the operation of the mountains, practically uninhabitable from malaria. The foot of the Drakensberg, from Table Mountain at Cape Town to the lagoon known as St. Lucia Bay, is practically conterminous with the sea. On this account moisture condensing into rain and falling on the range runs directly into the sea, there being no flat land intervening to receive it. Natal being part of the side of that range, its rainfall descends on the eastern watershed of the Drakensberg and runs directly into the Indian Ocean, leaving the earth and air dry and cool. But from St. Lucia Bay, north-east of Natal, on account of the westward tend of the mountains, the rain which falls on the Drakensberg, increasing from occasional thunderstorms in Natal to a torrential downpour as the mountains pass north and approach nearer to the equator, does not flow directly into the sea, but is in a great part absorbed by the ever-increasing plain which, as the mountain foot recedes westward, interposes between the range and the sea. From this vast plain arises the malaria which makes Eastern Africa uninhabitable for Europeans. The non-saturation of the soil of Natal is not only demonstrated by these physical features but also by the fact that it is completely free from malaria, which it certainly would not be if it was in the least water-logged. It is necessary thus fully to explain the origin of the malaria north-east of Natal to make it clear that the soil of that colony is dry and its surface and sub-soil well drained. Anyone watching a rainstorm forming in Natal would be surprised to notice that the clouds seem to come from the interior, where nothing but the waterless continent of Africa exists, the apparent marvel being that rain seldom or never seems to come from the direction of the sea. Great masses of cloud can be seen forming on the Drakensberg or rapidly condensing and passing down the spurs of that range to the ocean, the moisture from which the rain is formed having passed eastward with the south-west wind until stopped and condensed by the mountain range in the interior, often with the grand electric disturbance so well known as the Natal thunderstorms.

The Drakensberg range runs north-east through Natal, following the coast-line, its spurs south-east, practically, if irregularly, at right angles to the main range. Rivers having their origin in the highlands run down its valleys in an easterly directly to the sea, rapid mountain streams for the greater part of their course. The prevailing south-west rain-producing wind of the summer is occasionally interrupted by gusts of hot dry wind from the north-east. The latter, being evidently obstructed currents, blow directly on the earth, thus having the power of raising the dust, and are the cause of the dust-storms of Natal which are the most trying feature in the climate; but, fortunately, they are not of frequent occurrence, being most prevalent in August, September, and occasionally later in the summer, but occur on the whole not oftener than a dozen times in the year. Apart from the power they have of raising the dust, which away from the main roads and towns is very limited, they are not unhealthy. The atmospheric obstruction is of short duration, the hot wind seldom lasting more than a day, and often only a few hours, and is always followed by the cool rain-carrying south-west current which, being parallel with the earth's surface, does not raise the dust, and being moisture-laden soon condenses into rain, refreshing and cooling the earth. Thus it will be seen that the prevalent winds in Natal blow across the valleys, not up or down them, the result being that in almost every valley there is an exposed and sheltered side and a point of greatest rest, the exposed being the south-west face on the north side of the valley, on which beat directly the wind and rain from the south-west and which is protected from the dry, hot, north-east winds. On the other hand, the south side of the valley, with its north-east aspect, is dry and sheltered from the rain-storms and is open to the hot wind. The result on the vegetation of these valleys is remarkable; the bush almost invariably occupies the south-west aspect of the upper ridges of the northern slopes and the grass is rank and sour, all directly the result of exposure to the south-west rains and being protected from the hot north-east winds; the ground retains moisture throughout the year in a sufficient degree to enable both grass and bush not only to grow but to resist the effects of the grass fires. So marked is this arrangement of the vegetation that the bush stops in a sharp and straight line along the tops of the hills as if it had been so planted by the hand of man and the grass becomes shorter and sweeter, the exposure to rain being less, and the drying greater. Deep in the valleys on the south side, well open to the north-east so as to escape the heat of summer, and high enough from water to avoid the cold in winter, which is always associated with water, is the best situation for a residence. Such is the situation in which Pietermaritzburg is built, and the choice of the site shows the knowledge of the country possessed by its Dutch founders. This rough landscape and weather guide apply more particularly to the highland and midland districts of Natal. Those seeking health there, suffering from, or threatened with, pulmonary tuberculosis, and who may wish to combine farming with that pursuit, must never forget that shelter is the great desideratum for man and beast in South Africa.

Natal, being practically the side of a mountain, possesses three fairly distinct climates and has as a result a very wide range of products. The climate of the coast is that of a warm and semi-tropical district; humid during the spring and summer, from September to May, on account of its proximity to the sea and the prevalence of the sea-breeze during that season. The average mean maximum temperature throughout the year in this region is 77·8° F. During the autumn and winter, from April to October, the atmosphere is bright, dry, and free from frost. In this district tropical fruits grow well—oranges and other citrus fruits, mangoes, pineapples, bananas, guavas, and such productions as sugar, tea, coffee, maize (known locally as "mealies"), millet (or "Kaffir corn"), and tobacco. It is not a good cattle country, but cattle can be bred there; sheep do not thrive; poultry do well; and, for South Africa, it is thickly populated by natives and Indians. But it is not a region in which Europeans flourish. In the midlands the climate at an altitude of from 2000 to 3000 feet is very healthy and suitable for European settlement. The rainfall is about 30 inches per annum and the mean temperature is considerably lower than the coast. The atmosphere is much drier and there is a distinct fall in the temperature at night, which is refreshing and invigorating and induces sound sleep, the absence of which is perhaps the most debilitating characteristic of the coast, and during the winter frost at night is of common occurrence. The ground from

the sea rises rapidly, ridge after ridge, into apparently confused hills and valleys, until, within 40 miles of the sea, the altitude of the whole country has risen to over 2000 feet. The landscape is open and undulating, well watered, and almost free from bush. Horses, cattle, and sheep thrive; mealies, millet, potatoes, oat forage, green barley, peas, beans, and tobacco grow well; citrus fruits of all kinds, and apples, pears, peaches, and plums flourish. It is the home of many European farmers, but it is by no means fully occupied and would support a much larger population than it carries at present, and there can be no doubt but that when South Africa is thoroughly known it will do so. Within it are high, and at the same time sheltered, districts peculiarly suited to persons threatened with, or suffering from, tuberculosis; where in the case of actual disease recovery may take place or strength may be maintained by continued residence, and where feebleness of constitution, unless disease exists, may be secured from invasion. The high land, up to the foot of the peaks of the Drakensberg, from 3000 to 6000 feet above the sea, is an open, rolling, grassy country, covered with sweet short herbage, on which stock of all kinds thrive. Indeed, it is the stock country of Natal—for horses, cattle, and sheep there is no better district in South Africa. The atmosphere in summer is cool and dry and cold and frosty in the winter. During the spring and summer, from September to May, thunderstorms and hail are not uncommon and are often destructive to fruit and crops; but during the winter, from May to September, no rain falls. The district, however, is so well supplied with running streams that nothing but the grass suffers from drought. Then, indeed, the country is dry and the grass is parched; but for all that cattle reared in the district can find subsistence until the spring grass appears, which is always early. As, however, the breed of horses and cattle has improved, and lands become inclosed, farmers have been compelled to provide some winter food. Grass cut on the veldt and made into hay, with very little else, is found to be sufficient. This district will in the future be not only the principal dairying country, but it will produce sufficient meat to supply the whole colony, for there the largest and heaviest breeds of cattle can be reared. European fruit of all kinds thrives. There are to be found the most successful orchards in the colony. Mealies, wheat, millet, oats, barley, turnips, peas, beans, and potatoes grow well, and human health is excellent. Thus it will be seen that the climate in Natal is very dependent upon altitude, but though it is thus varied in the main it consists of two seasons—the summer, in which there is rain, and the winter, in which there is none. During the summer the heat is often trying, but in the midlands and highlands it is greatly relieved by the fall in the temperature at night. During the cold months, from the end of April to September, the whole atmosphere of the country, from the sea to the summit of the Drakensberg, is cool, dry, and still. But no description of the climate can adequately convey to the mind the exhilaration of spirits and body produced by the certainty almost of pleasant weather and unfailing sunshine, with the possibilities it affords of open-air life which the inhabitants lead.

If we search for tubercle in Natal we shall get some instructive information if in the first instance we seek for it among cattle born and reared on the veldt of the colony. The cattle districts of Natal are the midland and highland terraces of the Drakensberg, especially the latter, at an altitude of from 2000 to 6000 feet above the level of the sea. Though the highlands are the best cattle-breeding districts and the largest and finest breeds can be reared there, being comparatively free from ticks, red water, and other pests which retard the success of cattle-farming elsewhere, as yet it is in the midlands that the greatest number of cattle are to be found, the highlands being but sparsely inhabited either by natives or Europeans and the midlands being thickly populated by natives who choose these sheltered districts on account of the mild climate, where they can grow mealies, millet, and tobacco in profusion and will not be exposed to sharp cold in winter as they would be in the higher altitudes. Here also their cattle get through the winter better, their owners not being put to the necessity of providing special food and shelter for them, as cattle there can, under normal conditions, find sufficient food on the veldt and shelter from the wind all the year round. The natives must have been well aware of the superior character of the country under the ridge of the Drakensberg for maintaining flocks and herds, if from nothing else, by the fact that during the spring and summer, before Europeans had settled in this district, the veldt was covered with game—antelopes of many different kinds in thousands and great herds of quagga; but all its recommendations sank to nothing in comparison to the inducements offered by the midlands, and to the fear that the great Zulu possessed for the little Bushman with his bow and poisoned arrows. In former times, before the Bushman was exterminated by Europeans, this weird race of savage mountaineers dominated this region and drove the Zulus from the sweet grass of the highlands. The last spurs of the Drakensberg were the home of the Bushmen. Here in the caves and rocks they could lurk in safety and from these heights they could survey the whole country spread out before them; and they had to hand the latest news of importance, as far as they were concerned, in those strange but life-like figures and drawings on the walls of caves and the protected faces of cliffs, whereby one roving band could convey to another the dangers and benefits to be found in each locality. Cattle-thieves by nature, the country offered them every facility for indulging the habit. Stolen cattle once in the defiles of the mountains were lost to their owners, and if overtaken before they reached their refuge with their poisoned arrows the Bushmen were always able to make a good defence against their pursuers. No wonder that the cattle-loving Zulu gave them a wide berth and even looked upon them with superstitious fear. This is the simple explanation of the uninhabited condition of the highlands of Natal on the advent of Europeans, and clears that part of the country from the least suspicion of unhealthiness. The midlands were and are the home of the Zulu. Here he possessed, before the rinderpest swept over the country, perhaps a million head of cattle—small, hardy, Zulu cattle suitable to the country. These animals, and indeed those belonging to Europeans, may with truth be described as wild cattle; a very few were tame enough to submit to being milked, but otherwise they were as free as the buck; they lived in a natural state, unaffected in any way by artificial surroundings, and whatever their state of health might be, it would be the reflex of the local natural condition of the country in which they were reared. If that land had a natural tendency to develop any disease which would affect cattle, then undoubtedly these cattle must suffer from it, as nothing was done by man to protect them; the country, too, being practically unfenced, they were fully exposed to contagion. Thus it was that rinderpest in a few weeks swept through the land and for the same reason lung-sickness (pleuropneumonia) devastates whole districts. Therefore the condition of the veldt cattle with reference to tubercle should be an indisputable piece of evidence as to the prevalence of that disease in the country. As the greatest number of cattle are to be found in the midlands, which experience suggests are not so likely to be as free from tuberculosis as the highlands, the field of inquiry cannot be said to be selected for the purpose of coming to a favourable conclusion. The result of observation and experiment, as far as it has gone in Natal, is to prove that the wild cattle—that is, the locally bred cattle running on the veldt—are free from tubercle. Though such an immunity goes far to prove that the disease is innocuous to animals living in a natural state on the veldt, yet it does not prove that tubercle does not exist in the colony. That it does exist there is easily demonstrated by examining dairy cattle. If healthy wild cattle are caught, handled, confined in cowhouses and fed, milked, used, and treated as dairy cattle, they seem to lose their immunity against tubercle, they may become affected with it and may suffer from it in the same degree as dairy cattle in England. The immunity possessed by wild cattle in Natal is therefore not directly due to climate. This is an important point to establish for those who have to contend against the disease in climates which are supposed to be favourable to its development.

Again, take the well-known history of another animal, the monkey, with reference to this disease. These animals, captured in a healthy condition, carried to Europe, and confined in cages, even though the greatest care is taken that their surroundings are healthy and the air they breathe is warmed, yet they die in great numbers from tuberculosis. Neither the cow nor the monkey eat meat or drink milk and could not be affected from their food, yet neither a warm climate nor food free from tubercle was sufficient to protect them. Both fall victims to the disease on losing immunity and both in common suffer this loss by being subjected to a complete change in environment and to confinement. There being ample evidence to prove that tubercle bacilli are to be found everywhere, the tissues of these animals must have been able to resist the growth

of the bacillus in their wild state. Contact is therefore not the cause of the invasion; that must have taken place frequently before. The change is in the animal itself—it has become vulnerable. Exactly the same set of events occur with reference to the bacillus of putrefaction. When death takes place immunity from its invasion disappears; it develops in the body and decomposition follows, exposure to the bacillus being the same before as after death. Something has died in the cow and the monkey on their confinement which permits of the bacillus of tubercle developing. What, then, is this natural immunity which is thus capable of resisting the growth of a bacillus under one set of circumstances but is lost under another? It is evidently the result of bodily perfection and is the product of selection. It is very different from scientific immunity, though its results, while it continues, are the same. It does not last as long as that caused by vaccination against small-pox, but natural immunity, being dependent on selection and perfection, is more to be desired than scientific immunity, which has nothing to do with either, and can be established in the weak and diseased, while that of nature can only come after the weak have been made strong and the diseased are cured, and is thus always salutary, whether it is applied to the individual or to a race or species. If we can discover nature's secret and adopt it, or as much of it as climate and circumstances will permit, we shall be advancing undoubtedly on the right road. We may thus, in a great measure, supersede the necessity for the discovery of scientific methods for establishing individual immunity which, though extremely important from a personal point of view, are essentially destructive, as they tend to preserve the unfit with the fit, and which with reference to this special disease (tuberculosis) may not be attainable.

That such natural immunity does exist, to a greater or less extent, against the invasion of almost every specific bacillus, no one with any clinical experience will deny. Apparently such immunity differs with the bacillus, one set of circumstances making the body liable to the invasion of that of tubercle, another to that of tetanus, and a third to that of putrefaction, and so on, but these three bacilli in relation to the human body have much in common and apparently demonstrate this theory of natural immunity very clearly. The bacilli of all three seem to exist everywhere, and in any place a healthy living body can be made immune against their natural invasion, while, on the other hand, means can be found to cause it in the ordinary manner to become affected by all three. The law seems to be that when immunity is lost invasion follows. The futility, then, of fighting such bacilli becomes clear; as a side issue in the campaign it is right and desirable, but as a central idea it is wrong and misleading. For instance, inspecting food for tubercle is not of much use if the consumer is permitted to live in an abnormal environment under such circumstances as tend to cause loss of natural immunity—invasion and growth of the bacillus must follow whether it enters by food or otherwise. The absence of tubercle from the food of the cow and the monkey does not protect them, and the absence of tubercle from the food of human beings confined in a city slum will not save them. Attempting to destroy the bacillus is beginning at the wrong end of the problem. Greater attention should be paid to that which is attacked than to that which attacks.

Human beings in Natal are almost as free from tubercle as its cattle. Tuberculosis in one or other of its forms is to be met with, but the number of such cases is so small, and as the disease shows no signs of increasing as a local product its existence is more a warning than a danger. Tuberculous disease of the glands or of the membranes of children is as rare as pulmonary disease in adults, and tubercle of the skin is very uncommon. When, therefore, 60,000 people are exempt from the well-known ravages of such a complaint, something must have developed in them a natural immunity which is capable of resisting the growth of the bacillus. The presence of the disease among the people in the few cases which occur shows that it is immunity, not freedom from exposure, which keeps the disease in subjection. What, then, are the conditions under which these people live which have developed this immunity? Undoubtedly they are to be found in the open-air life which the benign climate and healthy country have made possible. Immunity has formed and maintained resistance in cattle and monkeys and develops the same power in man. The best Natal house is but a shelter from the sun and rain. It is, as a rule, only one storey with matchwood ceilings and well-ventilated roof. The people sleep with the windows open at night. Each family has a house to itself and often a piece of garden. There is no overcrowding and no one is deprived of fresh air and light. The towns have no echoing streets of three- and four-storey houses which exclude light and air from each other and the street between. There are no flats or slums. There is in Natal a tendency to abandon house-life. The love of reading, essentially a house pastime, is not a characteristic of the country. Open-air games, riding, bicycling, and out-of-door occupations of all kinds are much sought after. In the towns business will be suspended for a cricket or football match of any note. All the shops must be shut, and this only a very foolish trader would attempt to resist. In the cities never since the Greek republics has there been a community so given to gossiping on public affairs in the open air. When anything of interest stirs the public mind the whole population turns out to discuss the matter in the streets. All the inquirer after public opinion has to do is to pass from group to group, and he will quickly know how the public leans. So well understood is this that members of the Government, well-known public men, newspaper editors, and politicians of all kinds can be met in the highways and byways gathering information. In no part of the world is the "man in the street" such a reality or so supreme.

So mild is the climate that people can sleep in the open air at night without risk. A favourite form of picnic is to camp out in tents for a week or a fortnight at a time, and a blanket or less is considered sufficient shelter at night. There are no factories and night-work is almost unknown. It may not be possible to conduct the business of the whole world in such a manner, but those who so live are certainly more free from disease of all kind, more especially tubercle, than the hard-working, overcrowded populations of European cities.

The Zulu natives of Natal are a stalwart, healthy race, husbandmen by calling, and are in possession of a large proportion of the colony as theirs by right. They are a prosperous and happy people. The uncivilised Zulus can be said to be free from tuberculosis in all its forms, but with civilisation the disease appears. The Kaffir inhabitants follow the rôle of the cow and the monkey in that respect. Confine them, alter their diet, make them wear clothes, and the less robust soon lose their immunity and fall victims to the disease. There is a high mortality among the children of the wild Kaffirs, probably three times as great as among Europeans, but it is not from tuberculosis. As with Europeans, so among the uncivilised Kaffirs, an occasional case of pulmonary tuberculosis is to be found. Tubercle of the skin is rarely seen. The diet of these people in their wild state is quite different from that of Europeans. In Natal the latter eat more meat than would be considered wholesome in Europe, and is even less suitable to a climate like Natal. The Zulu Kaffir lives in his natural state on maize, called locally "mealies," made into porridge or cooked in some other way, and curded milk; but the staple article of his food is Kaffir beer or *tshwala*, a thin fermented porridge made from millet ("Kaffir corn"). This Kaffir beer leads to many a faction fight. Occasionally this diet is varied with a substantial meal of meat. *Tshwala* is prepared by allowing millet to sprout, thus malting it. It is then dried and stored for use and at any time can be made into beer by a very simple process. It is first pounded into a rough meal, put into calabashes, into which is poured a sufficient quantity of water, and the whole is allowed to ferment, during which time it is stirred, skimmed, and kept at a temperature which aids the process. When it has acquired the right alcoholic strength, which is about that of lager beer, it is fit for consumption. It is given to children a few weeks old, and does not disagree if sound and given with judgment. It is easily digested, as most of the starch in the grain has been changed by fermentation into glucose. It has a sour, pungent smell. Its taste is tart, pleasant, and agreeably refreshing. It is most sustaining, but it is thickish and reddish-yellow in colour. It possesses the power of dilating the stomach after it is drunk by the quantity of carbonic acid gas which it evolves, a most valuable property where there is a tendency to contraction of that organ, as takes place in many wasting diseases, especially in phthisis, where contraction of the stomach, and consequent inability to take food, with failing appetite, tends greatly to hasten a fatal result. I have used it freely in wasting diseases of different kinds and have always found it most invigorating. I believe it would be a valuable article of diet for the purpose of sustaining strength and combating waste in phthisis, not

only on account of its digestibility but also for its power of dilating the stomach. It contains a considerable quantity of alcohol which is quite capable of causing intoxication, but this alcohol is of such a digestible character that it does not cause organic disease nor does it demoralise as results from drinking European spirits; on the contrary, it helps to sustain and to invigorate. Certainly alcohol taken in that form, even though the quantity imbibed daily may be large, produces no predisposing tendency to tuberculosis. On the contrary, I think it would materially help in the curative treatment of that disease. The effect it has is greatly to increase the adipose tissue of the body. It is to the consumption of *tshwala* that the well-known obesity of Kaffir chiefs is due.

In reviewing the vital condition of the Kaffir race some allowance must be made for the fact that every Zulu who arrives at adult age is a "survival of the fittest," the weaklings having been weeded out; but though this secures to a great extent a vigorous people it does not prevent a failure of constitution under unfavourable conditions, with the loss of natural immunity against tubercle which allows the bacillus to grow in the body. During their wild existence they live a life which tends to maintain what selection has started. They have no cities and consequently there is no overcrowding. Their grass huts are about six feet high inside, just enough space for a tall man to stand upright. These are not lasting structures, being often destroyed and renewed—change of site for his residence being a Zulu's commonest recourse for protection when serious illness has attacked his family, and though he thus acts more from superstitious than hygienic motives the result is alike beneficial. Thus the houses do not become the home of all the disease-producing bacilli which have generation after generation affected the residents, as in the case of the old, disease-sodden dwellings of the poor of Europe. To the Kaffir, poor or rich, his hut is a friend, though it is but a shelter and a place to sleep in. To the poor of Europe their houses are often a deadly enemy.

The lithe, wiry figure of the Indian, clad in his bright-coloured clothing, is a familiar and picturesque object in the Natal landscape. 50,000 British Indians reside in the colony. They have been imported chiefly for field labour and are employed principally in the cultivation of sugar-cane on the coast, but though by far the greater number live there they have spread far into the interior and are to be found in every centre of population from Durban to Bulawayo. They belong to the labouring class in India and are for the most part low-caste Hindoos. Banyans—that is, Mahomedan traders from Bombay—have also found their way to Natal and many have acquired considerable wealth. Residence in Natal causes the Hindoo labourer to improve greatly in physique which is especially noticeable in the second generation. This is the result of the climate, the country, and the food, Natal being in all three respects for him a change for the better. The Hindoos are industrious and healthy. Their houses are grass-covered huts, or shanties covered with corrugated iron or the tin of packing-cases. They are almost vegetarians in diet, living principally on rice, mealies, peas, fruit, dried fish, clarified butter, and occasionally a little flesh—mutton, goat, or fowl. They are by no means a temperate people as far as the consumption of alcohol is concerned. They drink spirits freely, especially rum. They are practically free from tuberculosis in any of its forms. It is an exceptional thing to find an adult suffering from pulmonary tuberculosis, nor do children suffer from it in any other region, and tubercle of the skin is very rare.

Here, then, in Natal are two alien races, Europeans and Indians, differing in habits, customs, and food, from one another and from the native Zulus, but both in common with the native presenting the same aspect with reference to tuberculosis—almost entire immunity. The open-air life which each race lives seems to be the only common influence they enjoy which could account for it.

If the general hospitals in Natal are visited cases of phthisis will be, indeed, found among European patients, but almost invariably these are immigrants, mostly young men and in the last stage of the disease. Latterly the number of such persons visiting the colony in search of health has greatly increased and has caused attention to be paid to the matter by the Government so far that shipping companies have been asked not to give passages to persons in advanced consumption, but otherwise no serious attempt has been made to stop the entry of such cases into Natal. No country, however, will long consent to such an invasion, and if it is not checked and some discretion is not exercised in the selection of cases I feel sure that the colony will follow the example of New Zealand and refuse entry to persons suffering from tuberculosis. The great majority of the persons so suffering who have lately arrived in Natal are not only in a hopeless condition but destitute. Very many go with the hope that, the country being a British colony, they will be able to get employment, but as most are palpable victims of consumption no one will employ them and their failing strength soon makes work impossible. They then pass through many stages of hardship, until finally they find their way to the hospitals, where they are permitted to remain till their death; but these institutions protest against receiving them as their limited funds are thus used in the treatment of hopeless cases which they should never have been called upon to admit. It is generally felt that the maintenance of such cases should be a charge on the country of their origin which they should never have been permitted to leave. If in the future Natal is to be used as a sanatorium for consumptives destitute persons must be sent there under some recognised system whereby they will be received and maintained in the colony until they are well enough to support themselves or until the end of their life. The present mode of casting them adrift is both inhuman and impolitic.

THE TREATMENT OF PHTHISIS AS A PREVALENT DISEASE IN HOLLAND.[1]

BY DR. R. DE JOSSELIN DE JONG.

WHEN the invitation sent by the committee of organisation of this Congress reached me, as one of the founders and the secretary of the society for organising sanatoria in Holland I was especially glad to be able to accept it because the movement is with us still in course of development, and I was convinced that for us beginners there could be much to be learnt here on this subject. Allow me, in a few words, as a contribution to a general survey about the organisation of sanatoria in Europe, to relate the state of affairs in Holland.

We must not be looked upon as behind-hand because Holland is among the last of the countries to erect popular sanatoria. This has been caused by the historical succession of opinions as to how phthisis should be contended with. How long was it not believed that high mountain air was the first essential for a good health resort for consumptives? and to this day many are found who see the strongest therapeutic agency in a mountainous climate, in the influence of higher air. For some years a home for poor Dutch consumptives has existed in Davos Platz, started by private charity, but the idea that we should build our own sanatoria in the mother country—our low-lying Netherlands—has only been conceived in the last few years, after the experience gathered at home and abroad had taught us that the dogma of the mountain air therapy could be abandoned. Dr. Hamoeh, our Nestor and president, Professor Kooyker and Dr. Wynhof, as well as others, have called repeated attention not only to the possibility, but to the urgent necessity, of founding popular sanatoria in our own country. What is being accomplished at Tuselbad, Laubbach, Halle, Rehburg, Bournemouth, Cheltenham, and other places can be accomplished with us, while it will be counted an advantage that the patients recover in the same climate in which they became ill. The change from sanatorium to their former life is less great if they have been treated in their own country.

In the beginning of the year 1897 about 20 men united to form a founding committee. Among them were the professors for internal diseases of all the four universities. This council has succeeded in awakening the interests of the country in their plans, and a society has been formed for the erection and provision of popular sanatoria for consumptives in Holland. 70 subdivisions were formed in different parts of the country with about 5000 members. H.M. the Queen-Mother graciously consented to become the patroness of the society. In the course of the first year 200,000 francs had

[1] A paper communicated to the British Congress on Tuberculosis, Section II., Medical, including Climatology and Sanatoria.

been collected and the plans could be drawn up for the first sanatorium. The great question in our country was where the first sanatorium should be—on the sea-coast or in the interior? Professor Kooyker had already spoken on this subject at the Berlin Congress in 1899, and touched on the difficulties and advantages of both situations. Notwithstanding that, in proportion to the size of the country, our coast-line is a long one, it is very difficult to find a suitable spot for a so-called "seaside sanatorium." The exposure to west and north-west winds makes most of the places on the coast unsuitable, especially in winter. We decided to begin with an inland sanatorium, and we believe that we have found an excellent situation, for it in the east of the country—in the province of Overysel. It is, however, still most decidedly our purpose, when we are in a position to build a second sanatorium, to have it on the coast, as we are convinced that the strong, pure sea air will be a mighty power against phthisis; and although this air may not be suitable for more erethic constitutions, for less serious cases and for torpid tuberculosis it will, without doubt, be of the greatest advantage. This has been sufficiently proved to us by the beneficial effect a stay at the seaside has upon scrofulous children.

There is a second reason why a seaside sanatorium should in time be built in Holland. H.M. the Queen-Mother when she ceased to be Regent in 1898 presented her estate, Orange-Nassau, together with a sum of 250,000 francs, being part of the sum collected by the people for a national memorial in her honour, to found a sanatorium for consumptive patients. Orange-Nassau Oord lies in Gelderland, also in the east of our country, and thus will be an inland sanatorium as well. This establishment is intended for paying patients only. Her Majesty appointed a separate committee of six members to manage her sanatorium for her. It will be opened in the course of the next two or three months as well as ours, so that before the end of this year Holland will possess two large sanatoria for consumptives. A third will soon be erected by the city of Amsterdam not far from the coast of the Zuyder Zee.

As I have said, the sanatorium "Hellendoorn," which will be opened in Overysel, and so called after the neighbouring village, bears the character of other continental establishments. It will at first contain 54 beds, but it is intended to enlarge the institution to accommodate 105 patients. It is intended only for poor patients and as much as possible, that is to say, for as much as the annual contributions will allow, the inmates will be treated gratis. In order to make the number of free patients as large as possible an attempt will be made to enlarge the funds by soliciting annual contributions from the Government, the various communities, and the industrial insurance societies. The less needy patients will pay a certain fixed sum, about 3*s.* 6*d.* a day. It is arranged to accommodate both men and women, strictly separated from each other, with special kitchen arrangements for Jews. The principal building is in the shape of a slightly bent half-moon, opening on the south. The verandahs, where the patients will be in the open air, are in the wings, while the domestic department is on the north side, more or less by itself. The building is sheltered on the west by extensive pine woods and on the north and east by hills covered with pine woods. A beautiful view to the south and west greatly increases the attractiveness of the place. Electric light and a central heating apparatus are being laid on. The floors are covered with torgament, as is the case at Sulzhaim in Uarz. It is rather expensive to put down, but its durability renders it cheaper in the end. Drinking water of excellent quality has been procured on the spot by boring. More than six patients will not be allowed in one room: generally there will only be four. Within an hour's distance there are no factory chimneys and no railways, so that there will be no fear that the air will be poisoned by either. The soil is sandy, dry, and porous. I have myself been able to prove by experiments in the sand dunes near the Hague that bacteria, among others even the rather vigorous bacillus prodigiosus, are entirely destroyed in a few days in sand, so that for a sanatorium for tuberculous patients this soil is especially suitable. As for the air itself, there are still followers to be found of the doctrine, "No cure without mountain air," but in our country we have ceased to believe this exclusively.

Last year a small private sanatorium was opened near Putten, in Gelderland, on a spot surrounded by pine woods and at about an hour's distance from the Zuyder Zee. The patients were able to be out-of-doors there until nine o'clock, or sometimes even till half-past nine, all the year round, just as well as in Honnef and other places. The results gained there will bear comparison with those gained at foreign sanatoria. The experience gathered has been short, but it does not in any way put our expectations to shame; on the contrary, it gives us reason to expect great things of a sanatorium built after the strictest and newest improvements as that at Hellendoorn will be. The patients will be subjected to a very strict *régime* analogous to the rules laid down in like foreign sanatoria. And here I venture to remark that the earnestness and perseverance with which the director and the nursing staff impress these rules upon the minds of the patients, impressing upon them their immense importance, will to a great extent fix the bounds of the useful effect of the sanatorium treatment directly and indirectly. I purposely use the word "indirectly," because, to my thinking, the indirect influence of a sanatorium is not the least of its influences.

A sanatorium for consumptives must have two useful effects: (1) the improvement of the health of the patients admitted—this is a matter of course; and (2) it must be a centre from which good and clear ideas on the subject of hygiene are constantly being spread amongst the poor and less intellectual classes. The discharged patients must be so imbued with the value of good fresh air, simple but nutritious food, a quiet, even mode of life, cleanliness of their homes as well as of their persons, and so on, that upon their return to their former life they may become the teachers of hygiene to those about them. The experience which I have had in this way, in only a few years, from different patients treated in Davos-Platz is really surprising. The patients receive a printed list of the rules which they have to keep, together with a number of useful hints which may be of benefit to them in their future life.

I cannot leave this subject without saying a few words on two points which belong to it, and which seem to me to be of the greatest importance. If the treatment in a sanatorium is to have the good and lasting effect that is to be expected, it is absolutely necessary that if the patient admitted is the bread-winner of a family (as is often the case), provision should be made for the remaining needy members of the family. The board of our society have therefore urged the sub-committees to take care that in such cases assistance is rendered to those left behind. This will relieve and cheer the mind of the patient, and have a good influence towards his or her recovery.

In the second place, care must be taken that what has been gained in the sanatorium is not lost as soon as the discharged patients return to their own unhealthy surroundings. In other words, the improvement of the houses of the working-classes should keep step with the erection of sanatoria. In dry, well-ventilated, healthy working-men's homes the entirely or partially cured patient will be able to continue in the hygienic rules of life which he began in the sanatorium, and the results gained will remain or even be improved upon. It seems to me that this is one of the most weighty points which can arise in a discussion about the benefit of sanatorium treatment. In our country various private parties are doing much in this direction. The well-known Agnetapark in Delft can be quoted as an example.

As it is especially desirable that only those patients should be admitted who are in a not too far advanced stage of the disease the application must be made by the family physician with the additional advice of a specially appointed medical man. There will be 20 of these consulting physicians appointed in different parts of the country. After their application the medical director must decide whether or not the patients can be admitted. By these means we in time hope to be able to show results which can equal any of those obtained in foreign sanatoria.

THE PROPOSED SANATORIUM FOR CONSUMPTIVES AT WINSLEY.—At the Victoria-rooms, Clifton, an influential meeting has been held in support of the proposed sanatorium for consumptives at Winsley, near Bradford-on-Avon. The Lord Mayor presided and amongst those present were the Bishop of Bristol, Dr. P. H. Pye-Smith of Guy's Hospital, Dr. Long Fox, Dr. L. A. Weatherly, Dr. Markham Skerritt, and Dr. Shingleton Smith. The Lord Mayor made an appeal for help from Bristol citizens and stated that Bristol will be allotted 15 beds out of the 60 to be provided.

ON THE RELATIONS OF TUBERCLE BACILLI TO OTHER BACTERIA RESISTANT TO ACIDS AND TO ACTINOMYCES.[1]

BY DR. ALFRED MOELLER.

DISCOVERIES that have been made in recent years of tubercle-producing bacilli resistant to acids and similar micro-organisms have made it impossible to diagnose the tubercle bacillus by the aid of the microscope alone. Before these discoveries were made it had been customary to call every genuine bacillus that was resistant to acids and alcohol a tubercle bacillus. It is true that what was known of the similar behaviour of the lepra bacillus with respect to colour reaction already showed that the tinctorial behaviour of the tubercle bacillus was to be regarded as dependent on its other biological qualities, that in course of time it might be possible to find other bacteria which were equally resistant to acids and alcohol and with the same peculiarities with regard to colour reaction as the tubercle bacillus.

There has been a good deal of discussion as to the nature of this colour-reaction and its relation to the real substance of the bacteria. Koch himself says that from a diagnostic point of view the peculiar colour-reaction of tubercle bacilli is at any rate of value, but that it is a great mistake to think that the etiological significance of tubercle bacilli stands and falls with its specific colour reaction. Recently Klein, and later Marmorek, have shown that quite young tubercle bacilli are not resistant to acid and alcohol. Marmorek attributes this to the fact that young tubercle bacilli are not yet covered with that fatty and waxy envelope which on the one hand prevents the ordinary basic pigments from coming into contact with the protoplasm of the tubercle bacillus, and on the other hand prevents acids and alcohol from decolourising them when once stained. Klein thinks that the resistance to acids of the tubercle bacilli depends on the production of chemical substances on the part of the bodies of the bacilli. These, in the young tubercle bacilli, are wanting, and therefore they are susceptible to acids. Borrel, by experiments, succeeded in taking away the resistance to acids and alcohol of the tubercle bacilli. Under the protracted action of warm xylol a growth-like mass could be removed from the tubercle bacilli, which was resistant to acids and alcohol, whilst the tubercle bacilli thus treated had lost these qualities, though they were still capable of producing tubercle. Whatever may cause this resistance to acids in the tubercle bacillus it is quite justifiable to attribute the same tinctorial behaviour of the other bacteria, which are resistant to acids, to a like cause. But this mutual colour reaction is only the outer band that keeps the whole together; what is of much greater significance is, that there is more or less close resemblance among the bacteria, and with the tubercle bacillus, with respect to morphology and pathogenesis.

Bacteria resembling the tubercle bacillus, and known to us for years, are the lepra bacillus, smegma bacillus, and the organism of avian tuberculosis. The bacillus of leprosy was first described, in 1877, by Armauer Hansen. It was found in leprous tubercles. It resembles the tubercle bacillus in form, but is generally of more uniform length, and shorter. It stains more readily than the tubercle bacillus—*e.g.*, it stains with aqueous fuchsin solution, even at room temperature, which the tubercle bacillus will not do. Neisser, who has done much to make the bacillus of leprosy more generally known, gives Weigert's method of granule staining as the differential stain. Neither Hansen nor Neisser have succeeded in obtaining pure cultures. Bordoni-Uffreduzzi, in 1887, is alleged to have succeeded in cultivating from the marrow of the bones of a leper a micro-organism resembling the tubercle bacillus, even as regards resistance to acids. The cultures were not maintained. Cultivated bacteria from the organs of lepers, described rather later by Babes, and still more recently by Czaplewski, differ from the genuine bacillus of leprosy in their incomplete resistance to acids. Both authors maintain that the bacteria cultivated by them resemble the bacilli of diphtheria. In any case it is very doubtful whether these bacteria cultivated from leprosy are the genuine bacillus lepræ. The smegma bacillus was first discovered by Tavel and Alvarez in 1885, in the normal preputial smegma, and also in the secretion of the outer skin, particularly where a collection of epithelium may occur, as in the anal and vulvar region, in the fold of the groin, or between the toes. With respect to differential diagnosis, especially in reference to urogenital tuberculosis, the smegma bacillus is undoubtedly of greater importance.

As a micro-organism resistant to acids which has long been known, I may also mention the organism of avian tuberculosis. It differs from the organism of tuberculosis in mammals in the appearance of the cultures and the temperature conditions. Bacilli of tuberculosis of mammals will not thrive at 42° C., whilst bacilli of avian derivation will thrive at this and even higher temperatures. Fischel, who worked under Huppe's directions, says that both micro-organisms are of one and the same kind as regards nutritive media. In consequence of the different physiological nutritive media of the colder mammalian bodies on the one hand, and the warmer avian bodies on the other, a distinction has arisen between the two kinds. By artificial cultivation Fischel succeeded in bringing about approximation in outer qualities between the two bacteria: he succeeded in getting the organism of tuberculosis in mammals accustomed to a higher temperature, and in given nutritive media he got a resemblance in the appearance of the cultures, but as regards pathogenesis he could not transfer one to the other. Fischel says that he was able, with the organism of avian tuberculosis, to bring about a general tuberculosis in a guinea-pig, but the cultures derived from the organs of this animal were not identical with those of avian tuberculosis. In my own similar experiments on animals I got the same results. Tuberculosis in cold-blooded animals is in the same way to be regarded as a modification of the tuberculosis in mammals. Bataillon and Terre succeeded in cultivating tuberculosis in mammals and birds by means of passing it through the body of a frog at room temperature. Lubarsh was able to modify tuberculosis in mammals by passage through the body of a frog, so that cultures taken from the spleen of a frog grew at a temperature of as much as from 28 to 30°. Dubord also cultivated cultures taken from fish inoculated with mammalian tuberculosis which also thrived at room temperature. I was able to produce cultures from the spleen of a slow-worm inoculated with sputum containing tubercle bacilli, which flourished at 20°, but which ceased to grow at a temperature of 30° and over. The cultures resembled in appearance those of avian tuberculosis. I have not yet succeeded in obtaining cultures which got accustomed again to a temperature of 37°, even after passage through warm-blooded animals.

Recently it has been possible to demonstrate a series of micro-organisms in the outer surroundings of man which in many respects resemble the tubercle bacillus. Tubercle bacilli were found in such appalling frequency in butter and milk that it led to an inquiry as to whether the genuine tubercle bacillus was really always found. Petri and Rabinowitsch were the first to make such experiments. Both succeeded in getting a bacillus resistant to acids and alcohol from butter, that was *not* the tubercle bacillus. The micro-organisms described by these two authors are so materially alike that they are both generally described as the Petri-Rabinowitsch butter bacillus.

I have lately cultivated from milk in pure culture a micro-organism similar to the tubercle bacillus which does not differ materially from the grass bacillus II. All bacteria resistant to acids cultivated from milk and its derivatives show a great resemblance to the grass bacillus. Taking into consideration the habitat of the latter—namely, cattle fodder—we are certainly justified in regarding the milk and butter bacilli as varieties of the grass bacillus. Such differences as there are—and these are very slight—may be explained by the passage through the bodies of animals. I could prove the presence of the grass bacillus in grasses much used for cattle fodder and could cultivate them in pure cultures. As they were first discovered on timothy grass (phleum pratense) I have named them timothy bacilli. The timothy bacillus has the shape of a slender little rod, sometimes slightly curved. Microscopically it is often impossible to distinguish it from the tubercle bacillus. Like the latter if often contains deeply stained granules;

[1] A paper communicated to the British Congress on Tuberculosis. tion III., Pathology, including Bacteriology.

oval unstained patches are found in its interior; it divides into branches, and sometimes has club-shaped swellings at one end. In the decolourising solution, as well as in sections with the ordinary staining methods, it behaves exactly like the tubercle bacillus. The timothy bacillus grows best at incubation temperature, but it thrives badly at room temperature. It thrives on all usual nutritive media. After 36 hours, even at incubation temperature, patches of colonies are distinctly seen. The cultures generally vary considerably from those of the tubercle bacillus, but a similarity is sometimes attained if the timothy bacillus, after several passages through the bodies of animals, is cultivated at a uniform temperature of 37°. It then tends to become more like the tubercle bacillus in its slow growth. As regards pathogenesis, the timothy bacillus produces in guinea-pigs almost the same pathological changes as the Petri-Rabinowitsch butter bacillus. It has a different effect on rabbits. In them, if the timothy bacillus is injected into the veins and arteries of the animal, changes are produced which it is difficult to distinguish from true tuberculosis. There is also a variety of the grass bacillus, a micro-organism resistant to acids, found in the excreta of animals, and therefore called the "manure bacillus." I found it in a manure-heap which had lain for months, and also in the fresh excrementa of cows, donkeys, and other herbivora. The manure bacillus bears a morphological and tinctorial semblance to the timothy bacillus; in growth of cultures and in pathogenesis it also resembles the grass bacillus II.

In this *résumé* I prefer to pass over the lepra and smegma bacillus on account of their relatively rare occurrence, and because so little is known of their cultural growth, and the avian and cold-blooded mammalian tubercle bacillus on account of their unimportance as regards differential diagnosis. We are, therefore, left with grass bacilli as a primitive form, with its varieties, milk and butter bacilli, and manure bacillus. With respect to colour reaction they all, with slight deviations, behave like the tubercle bacillus. The same may be said of their morphology. Though in form the different species vary more or less, it is often impossible microscopically, under certain conditions, to distinguish them from the tubercle bacillus, and the tubercle bacillus itself varies according to the nutritive medium that it finds. I have made innumerable examinations of sputum in which I have seen the rods somewhat shorter, sometimes longer, sometimes thicker, and sometimes thinner. B. Fränkel first drew attention to the fact that the tubercle bacillus in the florid form of tuberculosis generally took the form of short rods. Those forms which deviate from the ordinary bacillus shape, such as rodlets, ramifications, keel-shaped swellings, as well as oval patches in the middle of the bacilli which will not stain, deeper-dyed granules, &c., are met with in the tubercle bacillus, as well as in other bacteria resistant to acids. In cultural growth, however, the grass bacilli differ materially from the tubercle. In the first place, in the appearance of the cultures; even when now and then a more or less close resemblance has been attained through the methods of cultivation the tuberculosis culture shows such characteristics uniformly, so that it is easy to distinguish it from all the others. Then it stands apart in its subtle behaviour with regard to temperature. Whilst other bacteria resistant to acids thrive at room temperature the tubercle bacillus requires incubation temperature. The position of the tubercle bacillus is unique with respect to its excessively slow growth. Other bacteria resistant to acids form visible colonies at the latest after 24 hours at incubation temperature, whilst the earliest moment that growth has been observed in the tubercle bacillus is only after several days, even under the most favourable conditions of frequent transplantation on specially chosen nutritive media. This exceptional behaviour of the tubercle bacillus is very valuable from a differential diagnosis point of view. Several authors say that sometimes bacilli resistant to acids were found in the sputum in morbid conditions of the respiratory organs—e.g., in gangrene of the lung—which, on closer examination, did not prove to be genuine tubercle bacilli. Fränkel and Pappenheim proved this by dissection; Rabinowitsch proved conclusively, by pure culture of the bacteria, that it was probably a variety of their butter bacillus. I have frequently found these pseudo-tubercle bacilli not only in sputum from the lungs, but also in mucus from the nose and pharynx, coating of the tongue, sordes on the teeth, and secretion on the tonsils.

In those cases in which physical symptoms are entirely absent, and the suspicion of tuberculosis is based on the existence of bacilli resistant to acids in the secretion of the respiratory organs, the diagnosis may be confirmed by the following simple method, based on the slow growth of the tubercle bacillus and its peculiar temperature requirements. The secretion in question is mixed with nutritive bouillon and kept at about 30°. If there is a visible increase in the bacteria resistant to acids it is certain that it is not the genuine tubercle bacillus. Sometimes in the tubercle bacillus the sputum, mixed with certain nutritive media, increases at incubation temperature. This proliferation, due in all probability to the importation of globulin-like substances from the body, is, however, exceedingly small and ceases altogether after, at the latest, 48 hours; whilst in the pseudo-tubercle bacilli a persistent further proliferation takes place at 30°. There was no pathogenic effect noticeable either in the bacteria isolated by Rabinowitsch in gangrene of the lung or in those found by me in mucus from tonsils, nose, and pharynx.

Different occurrences in practical life bring out the differentiation of pseudo-tubercle bacilli from genuine tubercle bacilli even more than at the sick-bed. I should like to give but two chief examples. For years two of our most important articles of food—milk and butter—were looked upon with lively horror because all the bacteria resistant to acids they contained were supposed to be tubercle bacilli. The isolation of manure bacillus showed the untenableness of the conclusion that the proof of bacteria resistant to acids in the excrementa of cattle was undoubtedly due to the existing bovine tuberculosis in the animals concerned. As regards pathogenesis, all bacteria resistant to acids have this in common, that they cause a tuberculous-like disease in the usual animals experimented on, the genuine tubercle bacillus always, but the pseudo-tubercle bacillus only in a limited number of cases and under certain conditions. The whole appearance of pseudo-tuberculosis in the bodies of animals bears macroscopically frequently a striking resemblance to genuine tuberculosis. But in the tubercles themselves there is a visible difference; whilst the genuine tubercles are of a solid proliferating kind, the pseudo-tubercles are of a more inflammatory character with tendency to abscess formation. The typically histological condition of genuine tuberculosis giant-cells, epithelioid cell nests, caseation, is only met with in pseudo-tuberculosis in very rare cases, when under given conditions, the bacilli are introduced into the bodies of animals. Another peculiarity of the tubercle bacillus I should still like to refer to. If, together with butter, it is injected intra-peritoneally into animals typical tuberculosis does not result, but peritonitis sets in accompanied by severe formation of induration, exactly the same as follows the injection of pseudo-tubercle bacilli and butter.

Though the obvious resemblances between bacteria resistant to acids and the tubercle bacillus are so many and so great, they only produce an outward relationship. As far as the real, I might say, *inner* being of the tubercle bacillus is concerned, its pathological effect on the human organism, its etiological significance in tuberculosis, it occupies a perfectly unique position among bacteria resistant to acids.

EXAMINATION OF CARCASSES IN CASES OF CATTLE TUBERCULOSIS.[1]

Illustrated by 100 Lantern Slides taken from Photographs obtained at the Carlisle Public Slaughter-house.

BY WILLIAM BROWN, F.R.C.S. EDIN.

OF the numerous functions which a medical officer is called upon to perform, perhaps there is none having a greater degree of anxiety and responsibility attached to it than the examination of cattle carcasses as to their wholesomeness for human food. Apart from cases where litigation is in question the medical officer has frequently a difficult and delicate duty to perform. On the one hand, he has to protect the consumer against meat of a doubtful character, and, on the other hand, due consideration is to be paid to the owner, who may have taken every possible care to secure what appeared to be a perfectly healthy animal.

[1] A paper communicated to the British Congress on Tuberculosis. Section III., Pathology including Bacteriology.

Hence it is incumbent upon every medical officer to make himself acquainted with at least the rudiments of cattle anatomy and pathology, and, though this may entail a heavy tax upon his time and energy, anyone who makes a practical study of the subject will be amply repaid by the novelty of the field opened out and by the light shed upon human diseases.

Those of us who have had no practical acquaintance with the post-mortem appearances of bovine tuberculosis on examining a case of so-called chronic generalised tuberculosis for the first time will doubtless be impressed with the great diversity in the naked-eye appearances of the lesions presented, many of which have a strange look to those whose pathological knowledge is confined to that of the human body. While, on the one hand, there will be no difficulty in recognising acute miliary tuberculosis of the brain and lungs, yellow tuberculous deposits in the kidney, and, perhaps, tubercle growing upon the peritoneal coats of the uterus and bladder, on the other hand, the grape-like masses—some of which are dark-purple in colour, hanging by long necks from the parietal peritoneum, the lichenous-looking masses on the surface of the liver, the great enlargement of the anterior and posterior mediastinal glands, looking like a chain of lympho-adenomatous tumours, and the enormous tuberculous solid growths, weighing many pounds, attached to the diaphragm—present characters unfamiliar to us and form in appearance a striking contrast to human tuberculous lesions.

Another striking feature of cattle tuberculosis calculated to make an impression on a novice at meat inspection is the close correspondence existing between the regional distribution of the lesions in cattle tuberculosis and human tuberculosis. Thus in cattle tuberculosis we speak of tuberculosis of the brain, the eye, the lungs and pleura, the pericardium, the bowels and peritoneum, the liver, spleen, and kidneys, and of the bladder, uterus, lymphatic glands, bones, and mamma, just as we do in the case of tuberculosis of the human body. The late Mr. Charles Darwin, in speaking of the homological structures in man and the lower animals, pointed out that man is liable to receive from the lower animals, and to communicate to them, certain well-known diseases, and that this fact proves the close similarity of their tissues and blood, both in minute structure and composition, far more plainly than does their comparison under the best microscope or by the aid of the best chemical analysis. I think that there is, perhaps, no disease common to man and animals in which this observation of Mr. Darwin is better exemplified than in the case of tuberculosis. While there is, perhaps, no tissue of the bovine body exempt from tuberculosis, that portion of the lymphatic system constituted by the lymph glands and the great lymph sacs of the thorax and abdomen are most frequently affected. A point of importance is that striped muscular tissue in the mature animal is remarkably free from tuberculosis, even when the muscle is found in close juxtaposition to tuberculous parts. This is well illustrated in the case of tubercle of either the parietal pleura or parietal peritoneum, which may be extensively involved, yet the underlying connective tissue and muscle are apparently free from tuberculous deposit.

With regard to the physical characters assumed by bovine tuberculosis in the different parts of the organism I shall not weary you with pathological details, but describe very briefly and illustrate by lantern slides the post-mortem appearances which have come under my personal observation at the Carlisle slaughter-house. The negatives for the slide-work were obtained under many difficulties and with much labour. In conducting a post-mortem examination of cattle the medical officer of health has to rely pretty much upon his own originality for the method or technique of such an examination, there being, so far as I am aware, no available book on the subject. During the course of this paper I shall refer to a few practical points on the performance of the examination which experience has suggested.

The brain.—There are two methods of exposing the brain for examination, but perhaps the most expeditious is to make a mesial antero-posterior section of the skull with a fine meat saw. Owing to the brain being fixed in its case a clean section is produced with very little disturbance of parts. The two halves of the brain are then lifted out of their respective beds for examination. I have seen at least eight cases of tuberculosis of the brain. Tubercle of the brain affords a good example of miliary tuberculosis in the ox. It generally occurs in the base, especially near the pons and medulla, but in the case from which the next slide was taken it was well marked in the walls of the lateral ventricle where numerous miliary nodules, some being collected into little heaps, were present. These little heaps or collections explain how tuberculous growths, whether great or small, are formed by the aggregation of miliary tubercles. The microscope showed the miliary nodules to be placed just below the fine epithelial lining of the ventricle, the membrane overlapping the nodule being bulged outwards. In two of the animals with brain tuberculosis oblique carriage of the head was observed, in another vertigo, and in a fourth the animal was carted into the slaughter-house in a paralysed state.

The eye.—I have several slides illustrating tuberculosis of the eye. The disease usually begins somewhere in the uveal tract, the growth pushing its way forward into the anterior chamber, where it can be seen through the cornea as a nodular growth of yellow colour. In the case from which the slides were made the tuberculous growth pretty well filled the eyeball, bulging the iris against the posterior surface of the cornea. I have never been able to find bacilli in tuberculosis of the bovine eye. The same negative result generally follows a search for tubercle bacilli in the human eye.

The pharyngeal glands.—Tuberculosis of the pharyngeal glands, especially in those of the retro-pharyngeal group, is very common and may exist with no, or only very little, evidence of tuberculosis elsewhere in the animal. So frequent is tuberculosis of the pharyngeal glands that I have been for some years in the habit of condemning the head in every case where a partial condemnation of the carcass was determined upon.

The tonsils.—The tonsils are said to be of insignificant proportions or absent in the ox. Our experience teaches us that they are always well-defined bodies opening into a cryptiform pouch, and sometimes tuberculous.

The cervical glands.—The slide shown gives a good example of tuberculosis of the upper cervical glands in a calf affected with generalised tuberculosis, including marked brain tuberculosis. It is seldom that we have an opportunity of seeing this condition of tuberculosis of the upper cervical glands owing to their being removed by the butcher when they have attained palpable dimensions. In one case we were able to get a tuberculous upper cervical gland as large as the closed fist from an animal which was apparently free from tubercle elsewhere. There is one of the lower cervical glands which from its position always escapes the vigilance of the butcher. This gland, the prescapular, is inclosed in a mass of fat in front of the anterior part of the scapula near its edge. The position of the gland corresponds to the point of the anterior border of the scapula placed opposite to the free point or acromial end of the spine. This gland, like many other lymphatics, may be enlarged in tuberculous carcasses without displaying in its substance tuberculous deposits.

The heart.—Tuberculosis of the cardiac muscle I have never seen at the Carlisle slaughter-house, but tuberculosis of the epicardium and pericardium frequently. Nocard states that the tuberculous cuirass in tuberculous pericarditis causes atrophy of the cardiac muscles. In the cases which I have seen the heart has been much enlarged and the ventricular walls hypertrophied.

The larynx.—Several cases of tuberculosis of the interior of the larynx have come under observation at the slaughter-house. In one case there was a rounded tumour of about the size of a damson plum occupying the interior of the larynx, to which it was attached by a mobile neck at the junction of the alæ in front. The animal in which it occurred was said to have had a decided rattling sound in its throat during respiration. The tumour on microscopic examination contained numerous typical giant cells.

The lungs.—Of all the organs of the bovine body the lungs and pleura are the most frequently tuberculous, and the explanation for this I shall endeavour to offer further on. In a good many cases the disease is limited to the pleural membrane, but in the majority of cases the lungs also are involved. Tuberculous lungs are sometimes enormously increased in volume and weight from tuberculous growth. In one case a pair of lungs weighed 40 pounds, as compared with a normal weight of seven pounds. Tuberculosis of the anterior and posterior mediastinal lymph-glands forms a very remarkable feature in bovine tuberculosis. Even when the lung is little affected these glands are found to be enormously enlarged from tuberculous growth. A number of fanciful names are applied to the

lesions of tuberculosis, one of which is "pommelière." The potato or apple-like form is well seen in tuberculosis of the mediastinal glands. These glands are often matted together forming more than a foot in length. They are frequently calcareous, their cut surface having a very decided sandy feel. The fact that in a good many cases the pleura and mediastinal glands are tuberculous and the lungs apparently uninvolved points to the specific bacillus gaining access through the lymph glands of the throat and neck and not through the medium of infected air entering the bronchial tubes. In fact, we are led to believe from the post-mortem appearances that bovine tuberculosis is primarily a disease of the lymphatic system, including the great serous sacs, spreading to the various organs of the body to which these sacs are connected. Thus in the case of abdominal tuberculosis, the disease in a good many instances does not penetrate further than the peritoneal coverings of the organs. Therefore, when we speak of tuberculosis of the liver, spleen, uterus, and bladder, the expression often means nothing more than tuberculosis of their peritoneal coverings. If we regard the lymph-glands of the throat and neck as the chief portal of entrance of the tubercle germ it serves to explain why in cattle the pulmonary disease begins in the dorsal border of the lungs placed on each side of the vertebral column. The proneness of the apex of the human lung in the adult to tuberculosis has always afforded a subject for much theorising. A recent explanation of the frequency of apical phthisis in the adult is that of Professor Birch-Hirschfeld of Leipsic, who believes it is due to a peculiarity in the distribution of the bronchial tubes in the apex. He shows by means of fusible metal casts of the pulmonary bronchi of the human lung that the bronchi distributed to the apex pass almost at right angles from the main bronchus, thus facilitating a lodgment of the suspended matters of the inspired air in their terminal twigs. A cursory glance at his cast, however, conveys the impression that suspended solid particles in the air would be just as likely to harbour in the terminal bronchi at the base of the lung. It seems probable that the proclivity of the apex to early phthisis in man is due to the direct transmission of the disease to the overlapping pleural sac through the channel of infected lymphatics in the neck.

The liver.—In the majority of cases the disease is confined to the fine peritoneal covering of the liver. The tuberculous deposits on the surface of the membrane have often a lichenous look suggestive of the appearance presented by laboratory cultures of certain micro-organisms upon artificial media, as, for example, anthrax upon sterilised potato. In the substance of the organ it occurs in the form of nodules of various sizes from a pin-head to large masses several inches in diameter, containing puruloid matter. The liver is occasionally enormously enlarged, and in one case weighed 51 pounds, the normal weight of the organ being 14 pounds.

The spleen.—In the adult animal tuberculosis of the peritoneal coat of the spleen is extremely common, but involvement of the substance with the disease is practically never seen. Congenital tuberculosis of the spleen in the calf is said to be frequently met with. It is a remarkable fact that the spleen is the only abdominal viscus in the adult animal which appears to be exempt from tuberculosis, and yet its peritoneal covering is frequently enveloped in a mass of tuberculous growth. Probably some explanation of the singular freedom of the spleen from tuberculosis is to be found in the functional activity of the organ. Wherever we get structures freely supplied with arterial blood and where tissue change is rapid, as, for example, in the voluntary muscles and the muscle of the heart, there the bacillus finds an uncongenial ground for its operation. In the fœtus the spleen is inactive, and, beyond assimilating nutritive material for its growth from the fœtal blood does no physiological work. An additional reason for the exemption of the spleen from tuberculosis may be ascribed to the curious mode of termination of the arterial capillaries which are said to terminate in the reticulated tissue of the pulp, thus allowing the blood to come into actual contact with the tissue elements. Arterial blood as we know is unfavourable to the existence of the bacillus tuberculosus.

The kidneys.—The kidney in the adult animal is comparatively rarely tuberculous. The early stage of the disease is manifested by yellow deposits situated, as a rule, in the peripheral portion of the cortical substance, forming conspicuous lesions when the capsule is removed. The deposits furnish good examples of tuberculous follicles, the fibrous formation or capsule surrounding the follicles being well marked. In one case a tuberculous tumour, firm in consistence and equal in size to a large marble, was found growing from the under surface of the renal capsule, bulging the kidney substance inwards into quite a deep depression. Tuberculosis of the kidney, according to Nocard, originates from the deep layer of the capsule or sub-capsular connective tissue. The situation of this tumour gives support to Nocard's view. I have only seen one case of tuberculosis of the bovine kidney where the disease passed beyond the stage of a few tuberculous deposits in the cortical substance. This case occurred a few months ago and was characterised by the presence of the disease in nearly all the lobes of both kidneys, the deposits extending into the medullary substance where in one place a softened caseous mass existed. Suppuration of the bovine kidney would probably be as common as it is in the human subject, if circumstances were not altered in the case of the ox by the timely application of the pole-axe.

The peritoneum.—The peritoneum, like the serous sac of the pleura, exhibits the disease in the form of fine red granules, nodules, and polypoid masses. In the case of the peritoneum, however, the polypoid masses are more characteristic than they are elsewhere. Many of the polypoid growths are of a deep purple colour and their resemblance to grapes is such as to have led to tuberculosis being called the "grape disease." In Hayes's translation of Friedberger's and Fröhner's Veterinary Pathology, the grape disease is described as being synonymous with "perlsucht" or "pearl disease," but from the photographs already shown it will have been observed that there is a real pearl-like form of the tuberculous lesion as well as a grape-like form. The term "pearl disease" would be quite appropriate if applied to tuberculous growths, but gives us a very accurate conception of another and very common manifestation of thetuberculous lesion.

The uterus.—Tuberculosis of the uterine muscle and its peritoneal covering is common, and tuberculosis of the lining membrane of the uterine cavity is occasionally seen. The follicles are well marked and bacilli are abundant, and, as far as my experience goes, are more easily demonstrated than in other parts of the bovine body. The ovaries and fallopian tubes are frequently tuberculous, and in some cases the latter are enormously distended with caseous tuberculous growth, in which follicles and giant cells are abundant.

The bladder.—Bladder tuberculosis presents much the same character as tuberculosis of the uterus.

The udder.—Tuberculosis of the udder presents itself by small yellow deposits with or without calcification, cavities containing tuberculous products, or the tuberculous condition may be in the form of diffuse deposit or infiltration, which on section has a uniform yellow-white colour and cuts with a rasping feel. The naked-eye appearance of this latter form is more like cirrhosis than tuberculosis; but when a microscopical examination is made, tuberculous follicles and bacilli are found in abundance. It is important for the veterinary surgeon during his course of inspection of dairy cattle to remember the physical characters of this form, because the absence of nodulation might lead him to suppose that the induration is of a non-tuberculosis nature. In such a case the diagnosis may be helped by the tuberculin test. Induration of the udder is a common condition among dairy cattle, and we cannot expect cattle-owners to exercise much care in discriminating between a tuberculous induration and a non-tuberculous one, even if they possessed the requisite knowledge on the subject.

Bone tuberculosis.—Few opportunities are offered of seeing bone tuberculosis in cattle carcasses owing to the circumstance that the only sections of bone displayed are those of the spinal column and sternum. I have seen a few cases of tubercle of the sternum. The slide shows tubercle of the sternum, which probably became involved from an extension of the disease from a sub-sternal lymphatic. The tuberculous growth was easily picked out from the cancellated tissue of the bone and gave excellent examples of giant cells which were numerous and typical in character. Bone marrow is said to be an excellent culture medium for the tubercle bacillus.

The tubercle follicle may be regarded as a special arrangement and modification of the leucocyte or phagocyte for the purpose of resisting the invasion of the animal tissues by the tubercle bacillus. The giant cell forms a constant and conspicuous feature in the early stage of bovine tuberculous growth just as it does in human tubercle. The genesis of the so-called giant cell has always furnished material for endless discussion, the descriptions given in the various text-books

as to the formation of the cell being all more or less different and equally difficult to understand. From many observations of the giant cell in bovine tubercle I think, with Metchnikoff, that its origin is capable of a more simple explanation than those usually given in which such terms as "epithelioid cells," "karyokinesis," and "karymitosis" enter very prominently. On examining a giant cell on section a central dirty-yellow granular mass is seen in which numerous tubercle bacilli are often present, as many as 50 bacilli having been counted in bird tuberculosis. Surrounding the central mass we have a row of cells which, so far as I can judge, in no way differ in character from the surrounding leucocytes of the follicle. In some cases the giant cell is composed entirely of leucocyte-looking cells, but the typical giant cell consists of a central granular mass surrounded by a row of cells arranged in the form of a circular or oval ring. What we see under the microscope is evidently only a section of the cell, and probably the original cell is in the form of a solid sphere or some modification of this form. Hence what look like young giant cells may be due to segments near the periphery or poles of the sphere. The central portion or core may be regarded as the débris of dead leucocytes engaged in conflict with the tubercle bacilli in the interior of the giant cell.

The mode of action of the leucocytes in tuberculosis is such as to suggest instinct on the part of this blood-cell. As soon as the tubercle bacilli invade the animal tissue the leucocytes or phagocytes squeeze their plastic bodies through the walls of the neighbouring capillaries and go for the bacilli, which they isolate in groups and surround, forming the so-called giant cells. Many of the leucocytes of the giant cells are killed in their action against the bacilli, the débris of their bodies constituting the yellow material in the centre of the tubercle follicle. Outside the active zone of giant cells there is a zone of phagocyte reserves, and beyond this a zone of outposts engaged in constructing a fibrous wall to prevent further advance of the enemy.

TUBERCULIN AS A DIAGNOSTIC AGENT.[1]

BY HAROLD SESSIONS, F.R.C.V.S., F.H.A.S.

IN the present state of our knowledge it must be allowed that tuberculosis is a disease of a contagious nature—a virulent death-dealing disease that can pass from one animal to another and from one species to another. The power of resistance to the disease varies in different species of animals and even in different families or individuals of the same species. Allowing for these variations the fact remains that we have this death-dealing disease, terrible in its ravages, and we are met here to-day to ask ourselves and each other what means are the most effectual that we can direct towards lessening these ravages? The total eradication of the disease we may safely leave to the care of some future conference.

Apart from human beings, the animal in which tuberculosis chiefly shows itself is the cow. The two are so intimately connected in civilised life that it is natural that a good deal of danger is apprehended that the disease may pass either through the milk or flesh of an affected cow to a human being, or from a tuberculous human being to a cow. But quite apart from any danger to human beings, I have long held and advanced the view that the ravages of tuberculosis among our domestic animals is so great that for that cause alone we are fully warranted in taking all needful measures for its curtailment now, because we can get rid of it in the domestic animals long before we can do so among human beings.

After the first recognition of the disease some years ago the trouble that we had to contend with was to get an approximately correct diagnosis, and I think I may say, without fear of contradiction, that, except in advanced cases, we could not with any certainty diagnose 5 per cent. of affected animals. With the discovery of tuberculin a fresh stage was marked in the diagnosis of the disease. We soon found that we had an agent which had a marked effect on animals affected with the disease, and the next few years were devoted to brilliant anticipation, study, and rash assertions of the power of tuberculin. I wish to take this opportunity to remind and to emphasise the fact to some of the critics of the power of tuberculin that during those years many of us worked, not, as some people seem to think, to find out cases in favour of tuberculin, but to find out whether we could obtain any reliable results from its use and what those results were likely to be. Using some of the first tuberculin obtainable on cattle of my own the results appeared to be far from satisfactory. It was only after a prolonged and careful working under a variety of conditions that I became an advocate for its use.

I do not propose to deal with tuberculin from a laboratory point of view, because there are others better able to do so than I, and having been on the Army Remount Commissions during the last 12 months in Spain and South America I have not had the facilities needful to keep in touch with the advance recently made. I have been able to see and to hear a good deal as to the value of tuberculin from a practical and commercial point of view. The proposition which I put forward is, concisely, "It is expedient to use tuberculin for diagnostic purposes in cattle." At one time there appeared in the press a number of loose statements as to the incorrect results given, and the contradictory results obtained by using tuberculin. Some of the statements I took the trouble to follow up and invariably found that they were neither exact nor correct. They may have arisen:—(1) From a tuberculin being used that was old or inefficacious; (2) from the test being hurriedly or improperly performed; (3) from errors at the post-mortem examination; and (4) from the inability of the operator to understand what he sees.

1. *Old or inefficient tuberculin.*—Some few years ago I suggested that tuberculin was much too dangerous an article to be sold, except under strict supervision, and that the whole community would benefit by such supervision. A central authority alone should issue tuberculin; and though they might and probably would license several competent people to make it, all that is made should pass through their hands for issue. They should demand that with all tuberculin sent out within a month a report of how and where it was used should be sent to them, and as far as possible the results obtained with official temperature charts filled up. This would lessen the risk of the indiscriminate use of tuberculin and the chance of one animal being re-tested within a week or so. It would also form a basis for much-needed statistics. I consider this a most important point and shall bring forward a motion to that effect later.

2. *Hurried or improper performance of the test.*—Few people seem to realise how very delicate a physiological reaction the test is; and that only when an animal is in a perfectly normal condition can the test be applied. That in the case of cattle even bringing them in from a field to tie them up in a shed when they are not regularly tied up is enough to upset them for two or three days to such an extent that you may not be able to test them. It is quite natural that those who have animals which they want tested should desire to have them tested as quickly, cheaply, and with as little trouble as possible; and those who test animals have continually to fight against these influences. Otherwise the test results being incorrect they will bring on the tuberculin test a discredit that is not properly its own.

3. *Errors at the post-mortem examination.*—To make a post-mortem examination requires much time and skill, and simply cutting open an animal and looking at the larger organs cannot be regarded as a post-mortem examination. When after a reaction of tuberculin an animal is killed and no visible lesions are found, before believing that the test is wrong I always ask myself whether the post-mortem report is not quite as likely to be incorrect. I would even go a step further. It seems to me that a tuberculin reaction may be obtained when an animal is in the very early stages of tuberculosis and before there are definite marked lesions in the tissues. I should consider this to be very probably the case when animals from an inspected herd react to the tuberculin test and on slaughter show no post-mortem symptoms of the disease. If animals bred on a farm on which tuberculosis does not exist, and as far as can be ascertained there is no probability of the animals being affected, a reaction with negative post-mortem results may well be viewed as due to the tuberculin test if the conditions under which the test was applied were accurate—it may reasonably be called an error.

4. *Inability of the operator to interpret the facts.*—Several times I have met with cases where, after an animal had been

[1] A paper communicated to the British Congress on Tuberculosis. Section IV., Veterinary.

tested and a typical tuberculosis reaction had been obtained animals have been declared free from disease. On the other hand, cases have occurred where an animal's temperature has risen suddenly during the test, not in a typical manner, and no allowance has been made for an extraneous cause. A system of sending all temperature charts to a central authority and having them reduced to a graphic form would very materially help to eliminate this class of mistake. There is not time in this paper to advance the evidence in favour of correct results obtained by the use of tuberculin; I have already done that in some detail in a small book that, conjointly with Dr. T. M. Legge, I wrote after the publication of the report of the last Parliamentary Commission. I will therefore sum up the evidence in a sentence by saying that there are many thousand instances recorded where tuberculin has given correct results and these in cases where there were no other means of diagnosis. On the other hand, there are advanced some instances—not a very great number—where apparently the tuberculin test has been wrong. Amongst these, some of the cases that have been most prominently brought before the public are those of animals sold in Europe as being free from tuberculosis, but which two or three months afterwards have been tested in the Argentine and found diseased.

I had the opportunity while in the Argentine of talking over this matter both with the Minister of Agriculture, Dr. Garcia Merou, and with the Director of Agriculture, Senor Tidblon; and also I saw some imported animals while being tested, and a necropsy. I was kindly furnished by the Director of Agriculture with a very carefully worked-out series of answers to some questions which I raised as to the progress of the disease in the Argentine and what he considered the best means of checking it. He further kindly supplied me with copies of charts of temperatures of animals tested, post-mortem results, and in some cases with the certificates that had come from Europe. Between the dates of April 12th, 1898, and Nov. 15th, 1900, 2092 imported animals were tested, out of which 158 animals reacted to the tuberculin test. Of these 158 animals 51 were slaughtered and 107 were re-shipped principally to the Republic of Uruguay. They were re-shipped, because since April, 1898, no animal is allowed to enter the Argentine until it has been tested by tuberculin under the authority of the Argentine Government and certified as free from tuberculosis. If the animal reacts it has, if left in the docks, to be slaughtered. However, in January, 1900, the Government of Uruguay also established an import sanitary inspection; and as since that date no rejected animals have been re-exported there and only a few are re-exported to Chili and Brazil, almost all those that show any reaction are now slaughtered at the Argentine sanitary stations. Of the 51 animals that were slaughtered 50 proved on post-mortem examination to be diseased, the macroscopical diagnosis being confirmed by microscopical observations and inoculations on guinea-pigs. The one case that was incorrect was that of a bull that had swallowed a four-inch nail, which, perforating the stomach, had formed an abscess, causing septic infection with a rise of temperature. The rise of temperature was not typical and it was suggested by the veterinary inspector that the animal should be considered doubtful and re-tested, but it was thought, as it was a suspicious case, that it would be wiser to have it killed. These 2092 animals were nearly all pedigree cattle of value, some selling for several hundreds of pounds. At least 1750 had been tested in Europe before embarkation, and of these a total of over 1600 tests agreed in Europe and the Argentine. There were, on the other hand, over a hundred discrepancies. Can these be satisfactorily accounted for? I feel convinced from what I have seen and the information in my possession that the error in very many of the cases was made in Europe. The animals were tested sometimes in remote country places—sometimes after a railway journey; and doubtless in not a few instances the animal to be exported was the first one that had been tested by the operator, and experience had not taught him the need for great care. Again, it is possible under the present system of free use of tuberculin that a veterinary surgeon may test an animal and finding it to react the owner may at once sell it, and within a week another veterinary surgeon may test the animal for exportation, being quite unaware of the first test. The result and the certificate on which the animal is exported are wrong, because it is well known that you cannot correctly test an animal within some weeks of an injection of tuberculin. Again, it is quite conceivable that an owner may test an animal on his own account—there is nothing to prevent it—and then, not being satisfied with his own work, call within a few days for an expert opinion without admitting the fact that he has already tested the animal. All these and many other circumstances have to be considered by the practical mind before accepting all these discrepancies as being due to the tuberculin.

There is another point, too, that has to be considered. Between the two tests animals pass through the tropics, and in one or two cases I found while analysing these figures that an animal certified healthy in England had been carried by the same boat, and probably in the same stall, as an animal which the previous voyage had been slaughtered on landing and found diseased. This second animal on arriving at the Argentine reacted to tuberculin and a post-mortem examination showed it to be diseased. In view of the very contagious nature of the disease among show animals new fittings, mangers, &c., should always be used when conveying valuable animals. Besides these 2092 imported animals the tuberculin test has been officially applied in the Argentine to 52,716 dairy cattle and 21,873 other cattle, and the test is believed to be of practical value.

In passing, it may be interesting to observe that in the province of Buenos Ayres the percentage of animals affected with tuberculosis, as revealed in the slaughter-houses, is 0·476 per cent. on the total of 1899. The percentage increases to 2·32 in the highly-crossed Shorthorn cattle killed and decreases to 0·0012 in pure native cattle. Consequently it may be inferred that the number of animals affected increases in proportion to the higher degree of crossing with improved imported stock. During the last five years in the Argentine the slaughter-house returns show an increase of tuberculosis. In 1895 the percentage on the total number of animals slaughtered was 0·281; in 1896, it was 0·467. Considering these figures and the very strong feeling that the Argentine Government appear to have as to the need of testing all animals before they are allowed to enter the country, I raised the question as to whether when the re-embarkation of pedigree stock commenced, a *modus vivendi* could not be arrived at to prevent animals after having reached the Argentine being thrown on the importers' hands, causing much expense and friction. I am glad to say from the information supplied me that that Government would be quite willing to make suitable arrangements to test animals in England before embarkation, provided our Board of Agriculture would on their part furnish guarantee as to the testing, which they might very well do.

What the Argentine Government object to—and quite rightly in my opinion—is the loose way in which tuberculin is used in England. The Argentine Government wish to do all that they can to facilitate the importation of English pure-bred stock; at the same time, the statistics which I have quoted show the danger of an increase of tuberculosis in their large and valuable herds; and they are right in doing all they can to check its further inroads. For the good of their country, if tuberculin was correct in only 80 per cent. of cases, it must be of manifest advantage to use it; whereas, from our present information, it can be correct in over 95 per cent. of cases where it is used.

I have no doubt that many of the points which I have touched upon will lend themselves to your criticism, and that in the press afterwards, perhaps more than at this meeting, instances will be adduced to show that tuberculin is not reliable, but, in anticipating them, may I venture to reply that I have been careful in this paper to make the claims of tuberculin moderate, and that I have before writing considered and thought over from a practical and scientific aspect the objections already published, and I believe that under proper control tuberculin is a safe and reliable agent to use and the only means we have at present for approximately diagnosing tuberculosis in cattle.

In conclusion, I would beg to move that this Congress, believing that tuberculin is an efficacious and reliable diagnostic agent, liable to gross misuse whereby it becomes a public danger, would ask the Minister of Agriculture and the President of the Board of Trade whether it would not be feasible to allow tuberculin to be issued by a central authority only, who should demand from those who use it a statement of the results obtained. The advantages derived being the use of properly prepared standard tuberculin, the compilation of much-needed statistics, the minimising of the danger of the fraudulent or wrong use of tuberculin, and the supervision of the temperature charts.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv., Proœmium.

BRADFORD ROYAL INFIRMARY.

A CASE OF MALIGNANT INTUSSUSCEPTION OF THE SIGMOID FLEXURE; REMOVAL BY THE RECTAL ROUTE; RECOVERY.

(Under the care of Mr. J. BASIL HALL.)

THE junction of the sigmoid flexure and the rectum is frequently the site of a malignant growth, yet this seldom gives rise to an intussusception. Should, however, an invagination occur and the tumour present at the anus, the growth may be removed per anum and the intussusception relieved at the same time, though the cases in which this is advisable are not numerous, for usually a laparotomy would make resection of the bowel easier with a very slight increase in the risk.

A man, aged 56 years, was admitted into the Bradford Royal Infirmary on Oct. 14th, 1900, with all the signs of acute supervening upon chronic intestinal obstruction. He stated that 12 days prior to admission, without any previous symptoms, rectal tenesmus commenced, followed by the frequent passage of loose motions containing much blood and mucus. Vomiting soon set in, the abdomen became distended, and his condition passed into one of acute obstruction. On admission the patient looked much older than his years; his abdomen was considerably distended but still moved with respiration. The tongue was moist but very dirty and the breath was most offensive. The pulse was quick, soft, and compressible; the temperature was 99·8° F. The hands and feet were cold and his condition generally was feeble. On rectal examination the finger impinged one and a half inches from the anus upon an intussusception with an annular carcinoma at the apex. The mass appeared to be about five inches long. There was much sanious and offensive discharge.

Under ether, after stretching the sphincter, a view of the mass was obtained. It was quite black, with every appearance of sloughing. It was therefore decided, considering the condition of the patient, to relieve the obstruction by opening the colon in the iliac region and at the same time to gain what information could be obtained through the colotomy wound. The obstruction was thus temporarily relieved, but contrary to expectations no sloughing of the mass occurred except a superficial necrosis at its apex. At the end of 10 days therefore Mr. Hall decided to attempt resection after Mr. A. E. Barker's method. Ether being given the anus was divided posteriorly and the coccyx was excised, thus exposing about half the mass. A stout silk cord was then slipped over it and the intussusception was dragged as low as possible. Three silk ligatures were then passed with a hernia needle as near the base as possible. Each ligature included about one-third of the circumference of the wall of the intussuscipiens and the intussusceptum together, and the mass was then amputated below them. A stump about one inch long was left which it was calculated would speedily be obliterated on account of the great traction upon it. The opening in the rectum was closed. The silk ligatures were left long and hanging through the anus.

After the operation the patient recovered fairly rapidly but the silk ligatures did not come away, becoming loose without cutting through the segment of bowel included within them. At first this was attributed to the stump becoming less swollen and œdematous. Three weeks later, however, a prolapse of the remaining three inches of the sigmoid occurred through the colotomy wound. This piece of gut had a blind end and it then became evident that owing to the great traction it had been drawn up as soon as the ligatures had cut through and its lower extremity had then closed. On examination again under ether it was found that the distance between the remaining portions of sigmoid and rectum was so great as to exclude any possibility of uniting them. The remaining portion of the sigmoid was accordingly excised through the colotomy wound. The condition of the patient, therefore, was as follows. The descending colon ended by an artificial anus in the left iliac region; below this point the whole of the bowel had been removed with the exception of a small portion of rectum which ended blindly about five inches above the anus. The general health was excellent. The patient wore a well-fitting belt of webbing in which was a cup (similar to that on the colotomy truss) which covered the colotomy opening. This arrangement suited him better than a truss, as it allowed him to stoop and to undertake manual labour without chafing or becoming displaced.

The intussusception removed measured four inches. This, together with the inch left at the operation, represented about 10 inches of bowel. The base of the intussusception, therefore, was about six and a half inches and the growth was 11½ inches from the anus. Microscopically, the growth was of the usual columnar type.

Remarks by Mr. HALL.—It is now 13 years since Mr. Barker[1] published the first case in which he successfully resected a malignant intussusception per anum, and the rarity of such an opportunity is shown by the very few records of this procedure. Indeed, with the exception of the examples in Mr. Barker's first publication and his second case recorded five years later,[2] I am not aware of any other published cases. In the case recorded above the operation cannot strictly be said to have been performed "per anum," since the sphincter had to be divided and the coccyx excised before the base of the intussusception could be reached, but the case bears sufficient resemblance to those of Mr. Barker to be classed with them.

One of the most interesting points in the case was the manner in which the small remnant of sigmoid flexure protruded through the colotomy opening. I have spoken of it as a prolapse, but, strictly speaking, the protrusion always commenced as a true retrograde intussusception which became a complete prolapse as soon as the whole length of gut had escaped. In consequence of the shortness of this remnant portion of bowel the intussusception stage of the protrusion was necessarily of brief duration, but on more than one occasion I satisfied myself that a true retrograde intussusception occurred. This phenomenon has been observed before under similar conditions and recorded by Lawford Knaggs,[3] Golding-Bird,[4] and Barth.[5] It is not necessarily associated with the existence of an obstruction below the artificial anus, for in Golding-Bird's case a retrograde intussusception occurred through a patent Meckel's diverticulum. It is apparently a reflex phenome on produced by the surface irritation from the artificial anus. In the present case the protrusion not infrequently occurred when the dressings were removed and the abdomen was exposed to the cold air—a fact which lends colour to the view that occasionally intussusception is the result of irregular peristalsis set up by reflex nervous impulses.

[1] Transactions of the Royal Medical and Chirurgical Society, vol. lxx., p. 335.
[2] Brit. Med. Jour., 1892, p. 1226.
[3] THE LANCET, April 24th, 1897, p. 1137.
[4] Transactions of the Clinical Society of London, vol. xxix.
[5] Deutsche Zeitschrift für Chirurgie, vol. xxvi.

Medical Societies.

BRITISH GYNÆCOLOGICAL SOCIETY.

Complications and Degenerations of Fibroid Tumours of the Uterus as bearing upon the Treatment of these Growths.

A MEETING of this society was held on July 11th, Dr. J. A. MANSELL MOULLIN, the President, being in the chair.

Dr. CHARLES NOBLE (Philadelphia) read a paper on the Complications and Degenerations of Fibroid Tumours of the Uterus as bearing upon the Treatment of these Growths. Hæmorrhage was by no means their chief and only danger; there were the risks of necrosis, of myxomatous or cystic degeneration, of calcareous infiltration, of associated malignant disease, and of complicating adnexal affections, and even their indirect effects upon the alimentary, vascular,

and nervous systems might lead to death or invalidism. Dr. Noble then gave details in tabulated form of 218 cases of fibromyoma uteri upon which he had operated up to May 24th, 1901. Had operation not been performed the complications which were found to be present in 66 of these must inevitably have proved fatal, in 25 others they would have imperilled life, and they would have rendered 30 of the remaining patients chronic invalids. Therefore 78 of these 218 patients would, at a low estimate, have died from the complications present, while 15 would probably have been the lowest death-roll from hæmorrhage, chronic anæmia, cardiac and renal degeneration, or other direct effects of the tumours themselves, giving an estimated total mortality of 93 (42 per cent.). Even if the cases of malignant disease and large ovarian tumours were not included, at least a third of the patients would have died as a result of the tumour or of its complications. The disappearance of fibroid tumours after the menopause or after pregnancy was merely one of the curiosities in the history of these growths. In women with fibroids the menopause was delayed for from three to 10 years and even if improvement followed it necrosis of the tumour might subsequently take place. Twelve of his patients were over 50 years of age when they sought relief from sufferings which, according to classical teaching, should have already ceased. Only 91 of his patients had been pregnant. Deaths directly due to fibroid tumours were seldom recorded, as when the symptoms became grave operation was generally resorted to. Those advocating the expectant treatment agreed that when hæmorrhages had produced profound anæmia operation was indicated; yet anæmia materially increased the risk of narcosis, œdema of the lung, and sepsis, and anæmia when established might prove very intractable. Adhesions had in many cases increased the difficulty and risk of operation, while phlebitis and embolism had proved a source of danger both before and after it. In short, if left alone, more than one-third of his own cases would have ended fatally, in more than one-fourth the patients would have been chronic invalids, and of the remaining one-third but few would not have been incommoded by the presence of the tumour. It was difficult to say whether his own was or was not an average experience. The only table of cases resembling that upon which he based his observations was published by A. Martin, who had tabulated 205 cases, analysing the complications met with. Martin, however, made no reference to the condition of the adnexa. Allowing for this difference in classification the results were in each instance similar. At least one-third of the patients must have died as the result of the tumour or of its complications. Taking the mortality after hysterectomy at from 2 to 10 per cent., early operation not only reduced the mortality from the disease from over 33·3 to less than 10 per cent., but saved the patient a long period of invalidism otherwise unavoidable. Small multinodular sub-peritoneal fibroids in women over 40 years of age were those least likely to grow or to cause serious trouble, and there was a small percentage of cases in which operation was not more advisable than was expectancy.

The PRESIDENT, in drawing attention to a collection of specimens exhibited in reference to Dr. Noble's paper and which had been brought together by Dr. Macnaughton Jones, said that he thought that he was correct in saying that such a collection had never before been on one table. The specimens included tumours which had undergone calcareous, cystic, mucoid, necrotic, and teleangiectatic degeneration; others which were entirely œdematous or into which hæmorrhage had taken place; several complicating pregnancy and several in which, in addition to the myoma, a carcinomatous, sarcomatous, or cysto-sarcomatous tumour was present; a single, large, semi-fluctuating fibroma (exhibited by Dr. Snow and termed by him "monoma") which showed in one portion isolated tissue resembling carcinoma, a microscopical slide in this as in other instances accompanying the museum preparation; as well as specimens showing, in addition to the myoma uteri, various pathological conditions of the adnexa and broad ligaments.

Dr. H. MACNAUGHTON JONES, in opening the discussion, said that an examination which he had made of the specimens preserved in the museum of the Royal College of Surgeons of England and in the museums of several of the larger London hospitals showed that 85 per cent. of the tumours had undergone degeneration or were accompanied by some serious complication. It also rendered very evident the fact that a vast mass of material, invaluable in estimating the dangers and consequences of these growths, had passed through these hospitals and had been lost. Countless tumours had also been shown at societies of which no microscopical or even careful examination had been made, though the time had passed when it was of advantage to demonstrate the feasibility of their removal. One danger not often realised was that other pathological conditions of the uterus and adnexa were, by excusable errors of diagnosis, liable to be mistaken for fibromata and, even though of a fatal nature, allowed to remain without surgical relief until their removal had become difficult or impossible. Considering the frequency with which various degenerations and complications of these tumours were now known to occur he warmly advocated surgical treatment of them.

Mr. F. BOWREMAN JESSETT did not agree with Dr. Noble as to the relative frequency with which carcinoma and sarcoma co-existed with fibromata. He could remember at least five cases in his own practice in which the pathologist pronounced a portion of a fibroid tumour to be of a sarcomatous nature. The position of the tumour should be considered when determining the treatment; if subperitoneal it might in a large number of cases be permitted to remain. When submucous or interstitial myomata gave rise to hæmorrhage or symptoms of pressure, or were necrotic or of rapid growth, they should be removed. The opposite conditions prevailing, the surgeon could afford to wait.

Mrs. SCHARLIEB believed that a certain number of fibromata decreased in size after the menopause, yet waiting for any very problematical benefits which might then ensue involved serious risk. The youngest patient on whom Dr. Noble had operated was 17 years of age. She had removed, with Mrs. Stanley Boyd, a tumour from the anterior wall of the uterus of a girl 15 years of age. The edges of the uterine incision had been brought together and the uterus and its appendages had been left complete.

Mrs. STANLEY BOYD referred to the difficulty of distinguishing between a tumour which had been sarcomatous *ab initio* and one found on removal to be sarcomatous but which had become so as the result of degeneration in a fibroma. She asked Dr. Noble whether in his experience curetting ever permanently arrested hæmorrhage produced by a fibroid tumour. She regarded it as a temporary measure to arrest hæmorrhage, possibly with a view of encouraging the patient to undergo the major operation at a later date.

Dr. HERBERT SNOW said that the soft œdematous solitary fibroid first differentiated by Mr. Lawson Tait had from its inception a malignant tendency peculiar to itself. The common multiple, hard fibroid in a few rare instances underwent cysto-sarcomatous degeneration. Carcinoma might be present as a coincidental complication or as a result of the irritation and vascularity produced by a fibroma.

Mr. STANLEY BOYD said that the etiology of certain complications was obvious, as, for example, necrotic or other change in the tumour itself, salpingitis or pyelitis, but such a condition as cancer must be necessarily accidental, being a growth of epiblastic tissue. Sarcomatous degeneration was theoretically conceivable. A mesoblastic tissue already growing abnormally might apparently easily take on a sarcomatous nature. True degeneration, however, he believed to be rare.

Dr. HEYWOOD SMITH took exception to the statement that parturition was not followed by a shrinkage in the tumour.

Dr. J. MACPHERSON LAWRIE agreed with Mr. Bowreman Jessett rather than with the reader of the paper as to the indications for and against operation.

Dr. SKENE KEITH was much opposed to operation to the extent which had generally been approved.

BRITISH LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL ASSOCIATION.

Exhibition of Cases and Specimens.—Tumours of the Pharynx from their Clinical Aspect.

A GENERAL meeting of this association was held on July 12th, Mr. MAYO COLLIER, the President, being in the chair.

The PRESIDENT showed a case of Double Optic Neuritis

with Paralysis of both External Recti following Right Tympanic Disease. The interesting point was the cause of the neuritis.—Dr. C. O. HAWTHORNE suggested cavernous sinus thrombosis.—Dr. DUNDAS GRANT spoke of the possibility of tubercle.—Dr. R. H. WOODS also spoke.—The PRESIDENT, in his reply, objected on anatomical grounds to implication of the cavernous sinus.

The PRESIDENT also related a case of Deafness due to Chronic Sclerosis of the Middle Ear which had been greatly improved after relief of nasal obstruction, and he showed a case of Epithelioma of the Maxillary Antrum nine months after operation, in which there had been, so far, no return.

Dr. BARCLAY BARON showed a case of Complete Aphonia with Close Approximation of the Cords. It had resisted all treatment, and was brought forward for diagnosis and suggestions for treatment.—There was general agreement that the case was functional, chloroform narcosis, hypnotism, and the cautery to the enlarged veins at the base of the tongue being variously proposed.

Mr. LENNOX BROWNE showed a specimen of a Fibro-Myxomatous Polypus, removed from behind the Palate, which was found to have proceeded from the maxillary antrum through the opening in the inferior meatus made during the course of operation performed some months previously for the relief of maxillary empyema.

Mr. LENNOX BROWNE also showed the following: 1. A case of Pretuberculous Condition of the Larynx in a patient who had been treated by him 20 years previously for traumatic perichondritis due to the impaction of a chicken-bone in the larynx. The patient had since developed symptoms which pointed to tubercle, but both pulmonary and laryngeal evidences had been, to say the least, inconclusive. The main feature was recurrent aphasia, but with phonetic cough. 2. A patient with Sarcoma of the Pharynx who had been exhibited twice previously—first in March before removal, secondly in May after removal—and now again, to demonstrate, first, that a certain amount of infiltration suggestive of a possible recurrence had entirely subsided, and, secondly, in regard to the epiglottis which, formerly compressed by the growth, had now entirely recovered its form and position. 3. A patient, aged 66 years, with an Enormous Tonsil and Glandular Infiltration which had existed for three months, and which up to now, though causing comparatively little difficulty in swallowing, had been the occasion of severe pain. The microscopical examination revealed that the growth was a sarcoma, and it was suggested that although quite inoperable the case was one suitable for treatment by Coley's fluid, of which the exhibitor had had more than one favourable experience.—The PRESIDENT, commenting on the interest of the third case, expressed the opinion that the majority of malignant tumours of the tonsil were sarcomata.

Dr. A. MCCOLL showed a patient suffering from Laryngeal Tuberculosis in an advanced stage which had been treated by insufflations of resorcin and orthoform. Both deglutition and voice had been greatly improved and the laryngoscope showed several cicatrices of healing. The general treatment had been that of "open air" and the patient had gained a stone in weight.—The PRESIDENT, Mr. LENNOX BROWNE, and Dr. DUNDAS GRANT spoke in congratulatory terms on the result.

Dr. S. LODGE showed a patient with Lupus of the Nose cured by Excision according to the method of Anderson with an artificial nose of aluminium made by the patient himself which had proved a greater success than one of ordinary manufacture.

Dr. DUNDAS GRANT showed: (1) a case of Post-Diphtherial Paralysis; (2) a case of Ulceration of the Tongue, probably malignant; and (3) a case of Thrombosis of the Jugular Vein.

Dr. WOODS opened a special discussion on Tumours of the Pharynx from their Clinical Aspect. He related several cases in his own practice both in the naso-pharynx and in the lower pharynx and his methods of operating. The chief interest turned on the advisability of operation.—Mr. LENNOX BROWNE spoke in favour of removal at the earliest possible moment after diagnosis and related several cases.—The PRESIDENT discussed the question from the point of view of surgical anatomy, giving several fatal instances which, from the experience of others, might have been successful had they been attacked with courage in their early history.—Dr. DUNDAS GRANT confessed himself at a loss to account for the undoubted hesitancy of even bold surgeons to interfere with these cases, considering the great advances that had been made in radical operations generally.—Dr. LODGE related a case of, and showed photographs of a successful operation for, Removal of a Sarcoma of the Naso-pharynx and of Involved Cervical Glands.

Reviews and Notices of Books.

Einführung in die Augenheilkunde. Von Dr. J. HIRSCHBERG, Ord. Honorar-Professor an der Universität zu Berlin, Geh. Med.-Rath. Zweite Hälfte, erste Abtheilung. Mit 113 Figuren und einen Titelbild. (*Introduction to the Study of Diseases of the Eye.* By Dr. J. HIRSCHBERG. Second half, first division. With 113 Figures and a Chromograph.) Leipsic: George Thieme. 1901. 8vo. Pp. 249. Price 9 marks.

THIS part of Dr. Hirschberg's manual maintains the high reputation of its author. It is a matter for regret that his numerous engagements should have left him so little time for scientific work that nine years have elapsed since the appearance of the first part published in 1893. The students who read and profited by the perusal of that first part must have begun long ago to practise for themselves and will hardly require to be taught the principles required to be known and understood for the successful treatment of refraction cases. Dr. Hirschberg commences this portion of his work with the subject of Ophthalmoscopy, describing the invention of the ophthalmoscope by Helmholtz and its gradual improvement by Rekoss, Helmholtz's assistant, and others. He relates with some humour an event that happened to himself as he crossed the Atlantic. "Do you know," he was asked by an American, "my nephew who invented the ophthalmoscope?" "Certainly I do," replied Dr. Hirschberg, "and in Europe we call him Helmholtz." "The ophthalmoscope appears to be a French discovery," says another, a Frenchman, and we think we have heard the name of Cummings cited as the real originator of it by—an Englishman. It has certainly proved an invaluable aid in the recognition and diagnosis of the diseases of the eye, and upwards of a hundred modifications have been suggested, with all of which, says the learned professor, the practised observer can see the fundus of the eye and of many of which he describes the construction. He discusses the character of the illuminant that is used, and very properly objects to sunlight except under certain special conditions. He seems to prefer an oil lamp. In England it is probable that an Argand gas burner is most commonly in use. In regard to the red colour of the fundus as seen through the ophthalmoscope it is attributable, he says, to the light emerging from the observed eye being tinted in part by the retinal pigment and the pigment of the choroid, but mainly by the vessels of the choroid which absorb the blue and the violet rays. It is certainly not exclusively caused by the "visual red" as was in the first instance erroneously supposed by its discoverer Boll. Dr. Hirschberg describes at considerable length and with great clearness the respective motions of corneal, lenticular, and vitreous opacities under different positions of the observer, both with and without the employment of lenses. A long and interesting chapter is devoted to the pathologically formed precorneal plexuses of vessels. A historical summary is given of the observations that have been made on these vessels from the date of the Arabian physician El-Razi in the tenth century to the present time. Dr. Hirschberg's own researches agree with those of Professor Schöbl whose beautiful injections show that two sets of vascular loops are normally present—a coarser set continuous with the conjunctival and episcleral vessels and a finer set continuous with the scleral vessels. The

extension and development over the corneal surface of the former set result in the pannus crassus that is seen in cases of granular lids, whilst the deeper-lying set give origin to the vessels present in interstitial keratitis and forming the salmon-coloured patches of Hutchinson in syphilitic inflammations. In pannus crassus the vessels form plexuses of tree-like aspect, whilst in pannus tenuis their distribution resembles a brush. Once formed they are permanent and may be seen by transmitted light with a strong lens behind the ophthalmoscope, as Dr. Hirschberg believes he was the first to demonstrate. Under the general heading of Ophthalmoscopy Dr. Hirschberg gives, logically enough, an account of the opacities of the lens and in the vitreous—including, therefore, the different forms of cataract—the recognition of foreign bodies and cholesterine crystals in the eye, and, finally, the objective diagnosis of errors of refraction. This branch of ophthalmology is treated very skilfully and at great length, the physical and mathematical side of the subject being particularly dwelt upon. The remaining section of the work, dealing with the symptomatology and treatment of diseases of the eye and with the operative procedures, will, we trust, appear at an early date.

Dental Surgery, including Surgical Anatomy and Pathology: a Manual for Students and Practitioners. By HENRY SEWILL, M.R.C.S. Eng., L.D.S.R.C.S. Eng. Fourth edition, edited by W. J. ENGLAND, L.D.S.R.C.S. Eng., and J. SEFTON SEWILL, M.R.C.S. Eng., L.R.C.P. Lond., L.D.S.R.C.S. Eng. London: Baillière, Tindall, and Cox. 1901. Pp. 622. Price 10*s.* 6*d.* net.

THE present edition of this book is an advance on previous ones. The subject-matter has been considerably increased, new illustrations have been added, and the work all through has been subjected to revision. There is, however, room for further improvement, and in its present form the work cannot be regarded as a thoroughly trustworthy text-book for the student. Many subjects are scantily treated, many points on which stress should be laid in teaching are omitted, and some of the principles laid down are liable to misinterpretation by the student.

The first three chapters are devoted to (1) the Anatomy and Histology of the Teeth; (2) the Development of the Teeth; and (3) the Growth of the Jaws. To the text are added some excellent illustrations, most of which are from photo-micrographs and sections by Mr. Charters White, Mr. Arthur Underwood, and Mr. Hopewell Smith. These chapters are the most attractive in the book.

In the section dealing with irregularities in position of the teeth there is much to be desired—the classification is far from being clear; indeed, for the purpose of teaching it is almost useless. The etiology is scanty and the treatment in many places is not in keeping with present-day ideas. There is a decided leaning nowadays, and justly so, to treating irregularities at their early stage by the judicious extraction of teeth, and in many cases of the unerupted premolars. This latter line of treatment has been shown to produce excellent results, especially in that difficult type of irregularity known as superior protrusion. Early treatment, however, does not seem to be approved of by the editors of this book, and the reason is given on page 128—viz., that the operation is somewhat severe and necessitates a rather prolonged anæsthesia, making it, according to them, necessary to administer ether or chloroform, the prolonged method of administering nitrous oxide being apparently lost sight of. To their contention that the cases in which the early treatment is recommended can be remedied by ordinary methods we would point out that the great advantage of early treatment is that a crowded condition of the teeth is avoided and therefore mechanical treatment is unnecessary.

There is an excellent description of caries, with a good number of illustrations. In the section dealing with the artificial production of caries reference is made to the work of Mr. Pound and Mr. Sewill, but hardly sufficient credit is accorded to Dr. Miller of Berlin who was the first to produce caries artificially.

The chapter on the Treatment of Caries lacks lucidity and conciseness, while the classifications of diseases of the pulp and periosteum are meagre and not sufficiently up to date. Considering the large amount of literature which has accumulated around the subject of pyorrhœa alveolaris some reference at least to the more important papers is to be expected. We hardly think that the editors have given sufficient consideration to the investigations of Pierce, Kirk, and others on the question of certain varieties of periodontitis being due to the deposit of urates in the periodontal membrane.

There is an excellent chapter on Morbid Growths of the Teeth and Bland-Sutton's classification of odontomes is adopted. The chapter on Empyæma of the Antrum is good and contains much useful advice on treatment. The value of the book would have been enhanced by a fuller index.

LIBRARY TABLE.

Food Analysis. By HENRY LEFFMANN, A.M., M.D., and WILLIAM BEAM, A.M., M.D. Philadelphia: P. Blakiston's Son, and Co. 1901. Pp. 384. Price $2.50.—The value of a work upon food analysis depends chiefly upon the extent to which that work deals with modern methods. New and more accurate methods appear from time to time—almost day by day—in the scientific periodicals and those who have not access to periodical literature or do not avail themselves of it will be constantly finding out that they are employing methods which are obsolete or methods which give accurate results only after a tedious working. Even those possessing periodical literature on the subject find it inconvenient to seek out what may be new matter upon analytical method. The book before us is intended to help in this direction, being "a concise summary of analytic methods adapted to the needs of both practising analysts and advanced students in applied chemistry." Books of this type, however, need constant revision, so rapid is the advance of analytical chemistry. The authors' endeavour has been to collect most of the valuable matter relating to food analysis which has been published in official papers in the United States. However well they may have succeeded in this the fact that some of these methods though officially recognised in the United States are not so here will detract somewhat from the work as an authoritative guide on analytical methods in this country. The authors admit, however, drawing from the pages of the *Analyst*, the official organ of the Society of Public Analysts and many of the valuable works contributed by the members of that society. The chapter on Milk and Milk Products is much in a line with the very useful work issued conjointly by these authors on this subject some years ago. An admirable chapter on Colours is appended and a list of the colours permitted and forbidden by the National Association of Confectioners of the United States is added. Indeed, this chapter is a novel and valuable feature of the book. With the exceptions mentioned the book should serve as an excellent guide to students who are commencing the work of analytical chemistry as applied to food, and who have, of course, a knowledge of chemistry and of laboratory practice. It has been compiled with care and with the aim of making it a trustworthy source of reference in regard to modern analytical methods.

The Story of Wild Flowers. By Rev. Professor G. HENSLOW, M.A., F.L.S., F.G.S., &c. London: George Newnes, Limited. 1901. Pp. viii.-249. Price 1*s.*—In writing this work the author, to use his own words, has "tried to add something additional by putting life into those dry bones of structure" which generally forms the subject-matter of the ordinary

text-book. Evolution is the thread running through the book. A feeling of disappointment was experienced in reading the volume, for the same fault is obvious here which is characteristic of so many popular works on science—that is, too much ground is covered and the facts given are too numerous. One result of this is that as examples many plants are cited which the reader probably will never see and which will, in fact, remain nothing more than mere names. For example, on page 115 may be found descriptions of Hiptage Metablota, Combretum argenteum, and Ipomœa argyræoides. Many writers of books on popular science seemingly lose sight of the fact that the knowledge of the subject possessed by the majority of their readers is practically *nil*, and hence it is difficult to appreciate a large portion of the information given. The facts generally are correct, although some inaccuracies may be found. For instance, on page 16 we find that collenchyma is described as a "hardened cellular tissue." It is doubtful whether botanists will agree with many of the author's interpretations of his facts. Our space is insufficient to enter into a discussion of them, nor, indeed, is it desirable to do so here. A useful appendix is added giving information as regards the place of origin, &c., of some of the commoner garden flowers.

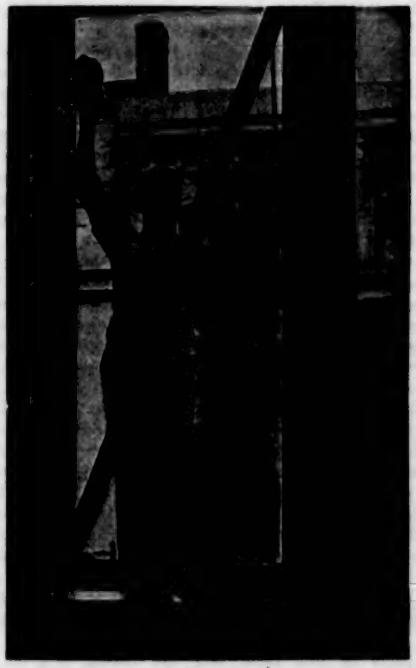
Catechism Series: Botany. Part I. Edinburgh: E. and S. Livingstone. Pp. 88. Price 1s.—This work consists of a number of questions and answers, the latter condensed to the smallest possible dimensions: discussion and explanation are reduced to a minimum, prominence being given only to facts. This is obvious when it is remembered that the morphology, physiology, biology, and classification of plants are considered in 88 small pages. The facts are accurate on the whole. On page 14 we notice that Ranunculus ficaria (*sic*) is given as an example of plants which are propagated by means of bulbils which are described as "buds which separate from the parent and develop into new plants on the soil surface." In the description of the crocus corm we notice that no mention is made of the contractile roots. Many portions are inadequately considered, amongst others might be mentioned geotropism and the ascent of sap. In no sense of the word could the work be regarded as a text-book; as a cram-book it may find favour with many who desire to remember a few botanical facts for examination purposes.

Dopes. By NATHANIEL GUBBINS. London: Everett & Co. Price 1s.—After the recent stir made in the racing world on account of certain assertions in reference to the "doping" of racehorses it might naturally be expected that small books or pamphlets on the subject would in a short time make their appearance. "Dopes" is one of these, and its framework consists of a dissertation upon the racing world in general with a chapter thrown in upon "doping." By the term "doping" is understood the drugging of racehorses in such a way that they may be enabled to obtain greater speed for the time being or to last out a race; occasionally too, it is done to depress a horse so that he may not win. The principal drugs used include cocaine, nitroglycerine, various preparations of alcohol, opium, indian hemp, and bromides. It is needless to say that in the hands of the unscrupulous and untrained the administration of noxious drugs often leads to unforeseen and disastrous results. Cocaine in particular is an agent which, even in the hands of skilled veterinarians, has been known to give rise to peculiar and toxic symptoms. Some experiments made a few years ago by Professor Hobday, F.R.C.V.S., showed that even when this drug was used for surgical anæsthesia the idiosyncrasy of the animal was a factor which must always seriously be considered. Similarly with other drugs, overdoses give rise to disaster and the detected "doper" is not a man to be envied. The author of "Dopes" relates several instances which savour suspiciously of drug administration—one in which a five-year-old mare "seemed to go mad, knocked down and seriously injured a gatekeeper, ... and running 'amok' against the wooden fence which abuts on the racecourse, broke her neck." Doping is a criminal offence and, if only by opening the eyes of the general public a little to the rascalities which may be practised in this line, Nathaniel Gubbins may be said to have done something towards the eradication of illegal methods so commonly associated with racing.

New Inventions.

A SAFETY WINDOW-CLEANING APPARATUS.

IN THE LANCET of June 4th, 1898, p. 1543, we gave an account of a window-cleaner's chair invented by Mr. H. Gold and said: "In our opinion there should be no necessity for such an invention, inasmuch as in the interests of humanity local authorities should have the power, if they do not already possess it, of making it illegal for a person either to sit or stand on a window-sill above the ground floor of a building for the purpose of cleaning a window. Until such necessary laws are made, however, we welcome any device which will prevent or minimise danger to life or limb from this cause." The by-laws have been made, but we think that very possibly, like so many other laws made for the comfort and



safety of citizens, they are no more enforced than are the laws about rolling casks, &c., on the footways between certain hours, or the laws about street noises. Windows in London must be cleaned; the majority of them are fixed except in a vertical plane and are too high for ladders to reach conveniently. Therefore, although a man may break the law by standing on the sill he will be able to do so without breaking anything else by using Mr. Gold's latest invention. As will be seen from the illustration it consists of a strong adjustable bar which fits diagonally across the window. To this are attached a strong rope and belt. Particulars of the apparatus may be obtained from Mr. H. Gold, 36A, Camomile-street, Bishopsgate, London, E.C.

THE LANCET.

LONDON: SATURDAY, JULY 27, 1901.

The British Congress on Tuberculosis and the Public Weal.

THE meeting of the British Congress on Tuberculosis which is taking place during the present week is being held under as favourable conditions as are possible while the Court is still in mourning and the country plunged in war. Many contend that such a Congress as the one now in our midst is of no practical utility. A heterogeneous gathering is, they argue, not the place at which the results of serious work should be brought forward. The tendency, they strongly affirm, is that any scientific paper read has usually been written for the personal glorification of the reader of that paper. Every man, they allege, has his own axe to grind, and wishes to grind it in public. To put the matter in its briefest form, they say it is "all advertisement." Others attack medical and scientific congresses from a different standpoint, but with no less vigour of invective. Science is serious, they remark; congresses are chiefly social arrangements which tend to become gigantic picnics, taking in vain the sacred name of Science. We do not agree with either of these views. But there is a substratum of truth in the statements that are so constantly made by the critical, so that it is fitting that we should state what are the benefits which we hope and believe will result from the Congress now sitting in London. This can be done quite briefly. We think that the communications which have been brought forward in the section devoted to the State and municipal aspects of protection from tuberculosis will be of great service to the public. The fact that the highest municipal representatives of some of the chief cities have taken an interest in these matters cannot fail to do good, and we look with the greatest confidence to the local authorities to give practical effect to the teaching which results from the laborious experiments of the men who have devoted their lives to scientific hygiene. To be of real use the knowledge acquired in the laboratory must be applied outside its walls. To do this falls within the scope of the municipalities. Without their active help nothing effective can be accomplished, but we may feel sure that all our urban and rural authorities will recognise, after they have read the proceedings at this Congress, that activity in the prevention of tuberculosis will be expected from them, and that their efforts will be generally supported by those beneath their supervision. There are questions in regard to the prevention and treatment of tuberculosis which it is to be feared are still beyond a measurable distance of settlement, but the work of the Congress will, it is hoped, do much to focus the attention of the public on certain important matters which concern their welfare and which depend for fulfilment on themselves alone. A knowledge by the people of the facts concerning the origin and mode of spread of tuberculosis cannot fail to be of use to them. When the facts are appreciated it will ultimately fall on the people to decide whether or not in the public interest all cases of tuberculosis should be notified in the same manner as that which is adopted in the case of some other diseases. Some of the refinements of bacteriological teaching will be regarded by the public as analogous to the theological discussions of the middle ages, and therefore best left to those whose mental constitution finds pleasure in them. This is well. There is no need for laymen to take any interest in such details. What is necessary is that it should be more generally understood that certain facts have been definitely established—e.g., that tuberculosis may be communicated from one person to another; that the infectious matter is capable of being conveyed by the sputa; that light, fresh air, and high altitudes are generally beneficial; that houses should be kept clean and well ventilated; that well cooked and nourishing food forms a suitable diet; and that intellectual stagnation is good for no man. If the public in their millions, whether at first hand through the press reports or more remotely from conversation with their fellows, can learn these simple lessons from the Congress, an enormous stride forward in practical sanitation will have been accomplished.

Professor Koch's Address at the Congress on Tuberculosis.

THE remarkable address which was delivered before the British Congress on Tuberculosis at the second general meeting by Professor KOCH cannot fail to attract attention throughout the medical world. And this not merely because of the personality of the speaker, whose presence at such a gathering was singularly opportune—for is it not to his genius that we owe our knowledge of the true nature of this widespread disease?—but because the message which he had to deliver was full of hope in a successful issue of the struggle against this prevailing scourge. Upon such a subject Professor KOCH speaks with an authority which none can dispute, and we may be sure that he would say nothing that was not based upon sound data. Nor does he admit that finality has been reached. With characteristic modesty he details his latest investigations and asks that others should take up this line of inquiry in order that the inferences which he has drawn from them may be confirmed or refuted. If they are confirmed the gain will be enormous, for the measures taken for the prevention of tuberculosis amongst mankind will be restricted within far narrower limits than the results of commissions and the laborious investigations of comparative pathologists have led us to believe that they could be. With this brief reference to the topic which seems to us to stand out prominently from all other parts of this noteworthy utterance we may follow Professor KOCH in his arguments, noting that they are marshalled with the method and enumerated with the lucidity to which all his deliverances have accustomed us.

In regard to its main theme the address was, as we have said, most hopeful, indeed optimistic, in tone. It was the expression of conviction that, now that we clearly apprehend the nature of tuberculosis the lines can be laid down for its prevention and eventual extirpation. No longer considered to be generated, however much it may be fostered, by conditions of "social misery," or to be transmitted by inheritance—except in the rarest cases—it takes rank with many another acquired disease which, like it, is essentially parasitic in nature. But various diseases are, as Professor KOCH reminds us, not to be combated by measures of the same type. We must know the etiological circumstances in each one separately and modify our lines of prophylaxis accordingly. We may group them all as infective disorders, but before we can successfully cope with them we must rightly understand in what way they are infective—in other words, by what means the parasite is conveyed to the human being. He cited the cases of plague, cholera, hydrophobia, and leprosy to show how no general set of preventive measures is applicable to check their spread, but that in each the particular mode of transmission has to be reckoned with. Thus human plague, except in its comparatively rare pneumonic forms, is now known to be mainly transmissible from the rat, and no matter how elaborate the measures to prevent infection it will not be stayed if this necessary factor be overlooked. Cholera is mainly diffused through the medium of water-supply and its preventive measures must have the regulation and purification of potable water for their aim. Hydrophobia cannot be hindered from spreading so long as the infected dog is suffered to roam about unmuzzled. Leprosy, in some respects akin to tuberculosis and transmissible from man to man living in conditions favouring close contact, is shown to be scientifically most effectively prevented by the segregation of the worst cases, thus following on the track of the system which in the pre-scientific era led to its banishment from Central Europe and from this country.

With these examples before him Professor KOCH next proceeded to inquire into the methods whereby infection of human beings takes place in tuberculosis. We venture to say that if this question had been put to the members of the Congress prior to their listening to this address there would have been an almost unanimous opinion that it was transmitted in two main ways—(1) by inhalation of dust containing tubercle bacilli; and (2) by the ingestion of food-stuffs, especially milk and flesh coming from infected animals. Professor KOCH admits the first in its entirety, but he deals a staggering blow to faith in the second alternative. This is so important and far-reaching a view that it demands a thorough reconsideration of the whole question of the transmissibility of tuberculosis from animals to man. Indeed, if Professor KOCH be right, time may prove that the labours of one whole department of this Congress have been thrown away and will come to be regarded as an example of misdirected science at the dawn of the twentieth century. Professor KOCH reminded his hearers that in his earliest researches he was somewhat sceptical as to the identity of human and bovine tuberculosis. His most recent work has almost, if not quite, changed his doubts into certainties. Our readers can glean for themselves the facts which led him to this conclusion. Summarily they may be said to depend on the experimental test that tubercule-free bovines (and other animals, such as swine, asses, sheep, and goats) are immune to infection—whether by inoculation or in other ways—as far as regards human tuberculosis, but singularly vulnerable to the bacilli of the bovine disease. And he appeals in confirmation of these results to the older experiments of others as to the insusceptibility of cattle to human infection and urges that the inquiry should be taken forward, as we do not doubt it will be on all sides. The German Government has already appointed a Commission with this object. Of course, Professor KOCH admits that because bovines may be insusceptible to human tuberculosis it does not follow that the converse is the case, and experiment is out of the question in this respect. But he declared with a boldness which compels admiration, since it runs directly counter to teachings which we have had from all quarters in the past decade, that there is very little evidence of tuberculous infection by way of the intestinal tract. He cited statistics from the Charité Hospital and other hospitals to show the rarity of intestinal tubercle in children apart from pulmonary and bronchial tubercle, and he inferentially led his hearers to believe that all such cases are explicable on the view that occasionally human tubercle bacilli may be swallowed rather than inhaled. But he goes farther and tells the sceptics that their doubts can be set at rest by an appeal to the experimental test. If the disease in the human subject be of bovine origin, then the cultures of bacilli from its foci will transmit the disease to a bovine inoculated with it: but if it be of human origin this test will yield a negative result. Here then we have a clear issue and one which, in the interests of the community, as well financially as socially, will, we hope, be definitely determined before long.

Setting aside this question of transmissibility from animals, which we consider more in detail in the article which follows, there is ample scope for preventive medicine in checking the ravages produced by infection through the ordinary channels. Professor KOCH shows us how closely this subject is linked with that of the housing of the poor; how under the prevailing conditions of overcrowding in great cities the means for infection not only of families but of dwellings are only too clear; and he paid a well-merited tribute to the work set on foot in this direction by Dr. HERMANN BIGGS of New York. He also pleaded for more special hospitals, or, at least, for special wards for consumptives, and attributed much of the decline in the disease in this country to the fact that we have so many of these institutions. Notification, disinfection, and the dissemination of knowledge of the nature of the disease amongst the people were other measures from which he hoped much good to accrue, whilst he bade the Congress not to be too sanguine as to the results to be expected from sanatoria, although he said enough to show the value of their work in limiting foci of infection and in increasing the proportion of recoveries of those attacked by the disease. All must feel that this address was worthy of the occasion and of the eminent leader in epidemiology by whom it was delivered.

Professor Koch and Tuberculous Milk and Meat.

"Though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is nevertheless already at liberty to say that, if such a susceptibility really exists, the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tuberculous cattle and the butter made of their milk as hardly greater than that of hereditary transmission, and I therefore do not deem it advisable to take any measures against it."

ALREADY, before these memorable words of Professor KOCH could be published in THE LANCET, they had carried solace or given rise to astonishment, and even incredulity, in most parts of the civilised world. Their effect it is at present impossible to estimate. If they are true there would seem no reason, *qua* tuberculosis alone, why we should not consume raw tubercle-riddled udder and give to our children milk drawn from similar sources. The truth, however, must survive, and it remains for us to decide wherein is truth. It would have been difficult for our distinguished and honoured guest to have chosen a more fitting or a more dramatic occasion for his remarkable announcement, seeing that not a little of the labours of the State Section of the Congress is concerned with the control of our milk and meat supplies. Accustomed as we are to accept the researches of Professor KOCH almost without demur, we feel, nevertheless, a little staggered by the directness and conclusiveness of the statement which prefaces this article. That statement has for its support much evidence; and the results of a series of experiments performed by Professor KOCH and by Professor SCHÜTZ of the Veterinary College in Berlin during the last two years are calculated to make us pause. Briefly stated, they are as follows. Two series of young cattle were taken and tested with tuberculin and were concluded to be free from tubercle. The members of one series were inoculated with, and made to inspire, bovine tubercle, those of the other series were infected with tubercle of human origin. The first series was attacked by tuberculosis and the second remained free. Similarly an analogous experiment was made with two series of swine and almost identical results were obtained; but there is this exception—a straw indicating something—"here and there little nodules in the lymphatic glands of the neck, and in one case a few grey nodules in the lungs" were found. Asses, sheep, and goats, into the vascular system of which the two kinds of bacillus were injected, behaved in the same manner as bovines.

Professor KOCH'S address is published in full in our columns and we feel sure that all will agree with him that "it seems very desirable that these experiments should be repeated elsewhere in order that all doubts as to the correctness of my assertion may be removed," and it is clear to us that the duty devolves forthwith upon the Government of this country. If Professor KOCH'S experiments are confirmed, and those who confirm them are able to draw similar inferences therefrom, a very marked change must occur in our methods of sanitary reform. If we can, according to Professor KOCH, consume bovine tubercle with impunity it is clear that much meat and milk have been wasted. In this country alone there have recently been two Royal Commissions upon the question of tuberculosis. One Commission decided, upon experiments done at its instigation by Dr. SIDNEY MARTIN, Professor SIMS WOODHEAD, and others, that the inference was justified that danger attached to the consumption of tuberculous milk and meat; the other laid down some useful precautions arising out of these inferences. According to Professor KOCH the inferences are unsound, as also are the deductions based upon the behaviour of tabes mesenterica in infants and the conclusions as regards the accidental inoculation by bovine tuberculosis of persons engaged in the care and slaughter of tuberculous animals. These cases are recorded by Professor NOCARD of Alfort, a delegate from France to the Congress, in his work on "The Animal Tuberculoses and their Relation to Human Tuberculosis." But assuming the series of experiments which were performed by Professor KOCH to have been in every way satisfactory, are the inferences which some will draw therefrom justified? Is it safe, in view of the serious consequences at stake, to assume that, because human tuberculosis is not communicable to bovines, the converse of the proposition—that bovine tuberculosis is not communicable to man—holds good? For our part, we must hesitate to affirm the proposition. The well-known difficulty of the communicability of small-pox to bovines and other similar phenomena must make us critical, as also must the fact that in inoculating human tuberculosis into bovines we are inoculating with a virus possessing a lower degree of virulence than is possessed by bovine tuberculosis. Is it, too, established beyond a doubt that pulmonary tuberculosis is always air-borne? These points and many others were raised by Lord LISTER after Professor KOCH'S address in a manner worthy of the highest traditions of English science and courtesy. We possibly incline to the view that the harm wrought by tuberculous meat has in the past been a little exaggerated by certain medical officers of health, but to pass from this to what amounts to a negation of any harm from tuberculous meat or milk is a somewhat heroic stride, and, as Lord LISTER remarked, it is "a serious matter if the conclusion be wrong." How serious in the direction of putting back reform in our meat and milk traffic, those who are familiar with the excuses of sanitary authorities for a policy of inactivity can judge.

Lord LISTER'S advocacy of caution was entirely endorsed by such observers as Professor NOCARD, Professor BANG, and Professor SIMS WOODHEAD. But their criticisms, though weighty, are under the circumstances insufficient. On all sides our medical officers of health will be met with the difficulty which has been raised, and with sanitary authorities, as doubtless with magistrates, the utterances of Professor KOCH will carry, as well they may, a weight which nothing but a repetition and extension of the experiments in question can affect. We therefore trust that the British Congress on Tuberculosis, which has opened under excellent auspices and from which much is expected, will make it one of its duties to press upon the Local Government Board and the Board of Agriculture the enormous importance of at once acting upon Professor KOCH'S generous and thoroughly scientific suggestion that

his results should be forthwith checked. In our view the Congress will fail in its duty if, after having been largely responsible for raising this great issue, it neglects at least to instigate the Government towards a speedy solution of the matter.

Annotations.

"Ne quid nimis."

THE FIRST REPORT OF THE ROYAL COMMISSION ON ARSENICAL POISONING.

WE regard with satisfaction the decision of the members of the Royal Commission on Arsenical Poisoning to report their proceedings from time to time and to summarise in a series of reports the conclusions at which they have arrived from evidence already at hand. The first report has just been published and relates chiefly to that part of the subject—viz., arsenic in beer—which first gave rise to the expediency of a Parliamentary inquiry being instituted to examine into the whole question of arsenical contamination of food. We approve this course strongly, especially in the present instance, even at the risk of some of the conclusions being premature, for the recent epidemic of poisoning by beer was a most serious occurrence and such as naturally caused considerable alarm. It was the obvious duty of the Government to allay this alarm without delay, to check the evil, and to prevent its recurrence. But as a matter of fact, as the commissioners in their first report acknowledge, when beer was discovered to contain arsenic steps were immediately taken by brewers and by sanitary authorities to ensure that this arsenical beer was withdrawn from sale, and this was done usually with commendable rapidity and as a result the epidemic came speedily to an end. Such a satisfactory termination was evidence of an intensely practical kind that—to adopt in part the phraseology of the terms of inquiry of the commission—(1) the amount of recent exceptional sickness and death was attributable to poisoning by arsenic, and (2) that such exceptional sickness and death were due to arsenic in beer. The Royal Commission, after hearing the evidence of over 50 technical and expert witnesses, have, of course, come to the same conclusions. Their duties, however, by no means cease here. They have yet to consider the apparent ubiquity of arsenic, by what safeguards the introduction of arsenic into foods and countless other things besides beer can be prevented, and whether it is practicable to keep out arsenic altogether or if not to decide what amount of arsenic in food may be safely regarded as negligible, and what methods of analysis may be relied upon to determine such limitations. Thus there are many important points left for future determination and this is frankly acknowledged in the first report. The Royal Commissioners propose to make further inquiry into the relative value of quantitative tests, and in the case of beer as to the possible existence of arsenic in it in some combination with organic matter which defies detection by the ordinary tests. They hope also to obtain further facts in regard to the many important medical and toxicological aspects of the epidemic, and by inviting the coöperation of public analysts throughout the country, and in other ways, to obtain further information with regard to arsenic in articles of food and drink other than beer. Further inquiry also must be instituted before a standard test, should it be decided to impose one, can be recommended. Lastly, it is evident that amendments in regard to administrative measures have to be considered, not only with reference to the question of arsenic in beer, but also in relation to the broader question of the machinery available to public health authorities to obviate the risk of arsenic or other poisonous substance gaining access to articles of food and drink in general. At present it is impossible to make final recommendations upon this important general question. The commission, however, think that as a provisional measure the machinery under the control of the Board of Inland Revenue might effectively be turned to account to check the introduction of arsenic into beer by way of its ingredients. To this end they recommend that the Board of Inland Revenue should possess, and should exercise, powers to specify in detail those individual ingredients of beer which are liable from their origin or mode of preparation to be contaminated by arsenic; to prescribe for all such ingredients, and for the different materials used in their preparation, an adequate test which should ensure their freedom from arsenic; and to prohibit under penalty the use in a brewery of any material which infringes the prescribed test. Dr. B. A. Whitelegge demurs to the wide terms of this recommendation, since, as he points out, they include the more remote materials which are not to be found in the brewery or in the sugar factory—such, for example, as the fuel which has been used in the malting. There is much to be said in favour, we think, of limiting this control to ingredients actually coming into the brewery which excise officers can sample and submit to the Government laboratory for analysis. A certificate of analysis from the vendor, it is well to remember, would only be a guarantee of the particular parcel of fuel from which the sample was taken. Clearly, if the kiln-dried malt is free from arsenic the fuel used for the purpose must have been free from reproach. The Royal Commission have begun their work well. They have yet many vexed questions to elucidate which will need considerable patience and considerable work, but their first report leads us to look forward hopefully to a satisfactory conclusion being arrived at as far as is possible having regard to the great number of knotty points which the inquiry involves.

THE "DOPING" OF RACEHORSES.

IN another column we have briefly reviewed a small work on the above subject which has recently been published for the lay reader. "Doping," or drugging, is supposed to be done to a much greater extent in America than in England, but in either country it can only be practised at racecourses where the rules are lax or the morals are of the lowest possible kind. For temporarily increasing the speed stimulants containing ether or alcohol used to be given, but these are difficult to administer without detection and have now been almost entirely superseded by the hypodermic use of cocaine. The effect of the latter upon horses and dogs has been made the subject of numerous experiments by Professor Hobday, F.R.C.V.S., a leading article on whose work (published in the *Journal of Comparative Pathology and Therapeutics*, vol. viii., p. 20, and vol. x., p. 80) appeared in THE LANCET of August 31st, 1895, p. 533. This observer found that in medicinal doses cocaine acted temporarily as a strong stimulant to the muscular system and this was well exemplified by the use of hypodermic injections in cases of chorea; in dogs affected with this troublesome disease the twitchings disappeared entirely whilst the drug maintained its influence, but the after-effect was bad, the patient being perceptibly weakened. After large or over-medicinal doses both horses and dogs became very much excited and quite frantic, it being impossible permanently to keep the subject still. This stage of hyperæsthesia is the one which the "doper" wishes to avoid, for until the effects began to pass off, it would be quite impossible for the movements of the

racehorse to be controlled. Besides, the wild appearance of the eye, the curious twitchings of the muscles, even if the animal was brought to a standstill, would at once give rise to suspicion. That the "doping" of racehorses is wrong in principle goes without saying, as from no point of view can it be defended. A horse should win entirely upon its own merits without the aid of artificial stimulants, quite apart from the bad after-effect which such drugs have upon the system when they are frequently used. In addition to the drugs which stimulate the use (generally for dishonest purposes) of those which depress or narcotise must not be overlooked. Of these opium and bromides are the most common, or even a dose of purgative medicine may be resorted to. The "doping" of racehorses is a crime which is punishable by law in addition to the social ostracism which would inevitably follow detection of the persons who used such means, and it is a practice which we are thankful to say cannot be considered at all common in our country.

THE SALE OF INTOXICANTS TO CHILDREN.

IT can hardly be doubted that the great majority of persons who have really given their attention to the subject are agreed that the Bill to prevent the sale of intoxicants to children should find its place in the statute-book. There is no question that children are employed in fetching liquor from licensed houses a great deal more than is advisable for their own good. Accurate statistics are hardly necessary to assure us of this fact, but recent evidence of this kind, if it be desired, is not wanting. In a letter published in the *Times* of June 4th the Marquis of Northampton quoted details of a series of observations bearing on this point. These included the following. On a Saturday between 9 P.M. and midnight 200 public-houses in four districts of London were under observation and a total number of 7019 children were seen to enter them. A respectable house in a quiet street was seen to be entered within the same hours by 26 children and 225 adults. A low-class house during the same hours was visited by 201 children and 1282 adults. These particulars may be regarded as illustrative of Saturday evening trade in London. In another town of 117,000 inhabitants 12,000 children were seen to enter licensed premises on a Saturday during four consecutive hours. The figures relating to one house observed during the seven legal hours on a Sunday are even more remarkable. The number of adults entering was 2558; that of children was 1365. Of the latter 706 were noticed to enter between 1 P.M. and 3 P.M. and 369 between 7 P.M. and 9 P.M.—that is to say, about the times when beer would be in demand for the family meals. Children according to the terms of the new Bill are young persons under 14 years of age. The statistics just quoted refer as nearly as could be judged to young people under 16 years of age, the average being 10 years. Where there appeared to be reasonable doubt as to the age the child was not counted. The Standing Committee of the House of Commons which is now occupied with this subject held a meeting on Friday, July 19th. As regards the expediency of the Bill itself no question was raised, but an amendment was moved in the name of Sir Lewis McIver to allow the sale to children of liquor in corked or closed vessels. This was carried by a majority of one. A further amendment moved by Sir W. Houldsworth to substitute the words "corked and sealed" for "corked or closed" was also adopted. There appears to be some ambiguity here in the proposed wording of the Bill which it is highly desirable to have rectified. A corked and sealed vessel is a definite object enough, a "closed" vessel might be made to denote almost any kind of receptacle. It might be a jug with a moveable lid or a pot covered in with paper. In either case the proper object of the Bill—namely, to remove from children as far as possible the temptation to help themselves to an intoxicant—would be virtually set aside. For this reason we trust that if the amendment is to stand as part of the Bill any existing uncertainty will be entirely removed and that care will be taken to have any vessel carried by a child properly corked and sealed. It is also to be remembered that much of the good which the Bill is intended to do will be done away with if its wording is not so framed as to require that children shall not be served at the ordinary bar but in a separate department. "Sipping" which some affect to scoff at, though it must often have led to freer indulgence, is only a part of the evil which it is sought to remove. The atmosphere of a bar-room with its frequently rowdy associations can hardly fail to exercise a mischievous effect on young people at the most impressionable period of life. But what, after all, is the practical value of this amendment in favour of the off-licence? To us, indeed, it appears to give little promise of practical utility and we should not be sorry if it were excluded. It is almost certain that the great majority of children who enter public-houses are sent, not for liquor in bottle, but for dinner or supper beer or for small quantities of spirits. It is difficult to see, therefore, what the amendment will do even for public convenience. There might, perhaps, arise an occasion, such as an emergency of illness in which no other messenger but a child was obtainable. In most cases of this kind, however, some adult neighbour would usually be at hand and the services of such a one would certainly be preferable. With the possible exception of such an occasion for which a special arrangement might be made we cannot see where the necessity should exist for the employment of children at all as carriers of liquor. We have noted that the limit of childhood for the purposes of the proposed Act is 14 years. We hope to see this age raised to 16 years. No hardship would be thus inflicted, and we believe that a fairer standard would then be realised of the period at which independent responsibility should be recognised.

CÆSAREAN SECTION THREE TIMES IN THE SAME PATIENT.

IN the Journal of the American Medical Association of June 29th Dr. J. W. Coakley has published the following remarkable case. A woman, aged 30 years, was in labour on August 3rd, 1893. In two preceding labours craniotomy had been performed for contracted pelvis. The conjugate diameter was two and a half inches. An incision was made in the abdominal wall from four inches above the umbilicus to two inches above the pubes. The peritoneum was opened and the uterus was lifted outside the abdominal cavity. A rubber ligature was passed around the uterus to prevent hæmorrhage. An incision four inches long was made into the uterus and the child was removed with the membranes intact. The uterine and parietal wounds were sutured. Recovery was uninterrupted. The patient was again in labour at term on July 27th, 1895. The placenta was attached near and over the os uteri. Cæsarean section was again performed: the cicatrix of the former operation was cut through and the wall of the uterus was found to be very thin. The membranes were ruptured and the child was removed. The placenta was removed and the adherent portions of the decidua were separated. Recovery was again uninterrupted. In February, 1900, the patient was in the eighth month of pregnancy. She was in poor health; the urine was loaded with albumin and there were headache and other symptoms of renal insufficiency. Labour began on March 2nd, but Dr. Coakley was absent and could not operate until the following day. On cutting through the abdominal wall at the side of the old cicatrix the peritoneum was found adherent to the uterus and also to the abdominal wall.

The adhesions were broken down and the uterus was lifted out of the abdomen. Dr. Coakley did not on this occasion pass a rubber ligature around the uterus, having abandoned the procedure on the ground that if tight enough to control the hæmorrhage the ligature would injure the uterus. In 13 minutes the operation was completed except for the tying of the abdominal sutures. Recovery was rapid, the only complication being a temperature 1·5° F. above normal on the fourth day. On the twentieth day the patient was removed to a house three miles distant.

THE CHEAP PISTOL.

THE *Times* of July 22nd contained a report of the inquest upon a youth, aged 19 years, who had committed suicide, after expressing in shorthand upon the margin of a novel by a popular lady author his approval of a phrase which he had found in the mouth of one of her characters that "suicides have no souls." On what grounds suicides were to be thus distinguished from their fellow-men does not seem to have been discussed either by the lady novelist or by Harold Paris, but the boy, having been apparently impressed by the profundity of an observation which seems to us meaningless, and having resolved to die in the company of a penny novelette and "The Romance of Two Worlds," found no difficulty in providing himself with a suitable weapon. Had he tried to drown himself or to stab himself to death his resolution would possibly have failed him—had he tried to buy a sure but painless poison he would have encountered difficulties in making the purchase; but a postcard found among his effects showed that a Birmingham firm was able to supply him with a pistol for the sum of 3*s.* 3*d.*, and it may have been, although it was not so stated at the inquest, that the 50 cartridges also possessed by him were bought at the same time and included in the same payment. The sale of cheap revolvers from time to time engages the transitory attention of Parliament, but the House of Commons shrinks apparently from interfering with the maker of cheap pistols, whether at home or abroad, and with a trade that is practically confined to toyshops. It has often been pointed out that a tax that would hardly affect, or which could be remitted from, the more expensive revolver used in warfare would entirely shut out of the market the gimcrack weapons that are now a source of danger to their usually youthful owners, to the friends of those young persons, and to innocent persons residing in their neighbourhood. Not a week passes but we see, not perhaps an account of deliberate murder or suicide by shooting, but an account of a pistol accident, or a wound inflicted in a quarrel by some young rowdy on some person against whom he has had a grudge or who has been passing by when he chose to fire or when the pistol went off in his irresponsible hands. Many more such cases are, no doubt, hardly reported or heard of; the calendar, however, of charges at the Old Bailey, published on the same day as the newspaper to which we have referred, contains two cases of attempting to murder with the pistol and, without doubt, it would be pretty safe to wager that the value of the two weapons alleged to have been used will not be found to amount to a sovereign. Can a trade which supplies these always dangerous, sometimes deadly, weapons be worth protecting? It is true that murders and suicides are perpetrated with the help of knives, razors, hammers, drugs, and other inanimate agents, but all these have uses of their own which are obvious and their abuse cannot altogether be prevented. The cheap revolver has no use. It is not a sporting weapon, it is of little or no effect as a protection against violence, while the householder who believes that he needs some such protection could afford to pay the tax on revolvers that we have contemplated and to purchase at the same time a superior weapon, although we must add that, as a rule, revolvers are more dangerous to the occupants of the house than to the intrusive burglar. Skill in the use of the toy pistol is not a prelude to skill with a weapon of use in war, for the schoolboys who buy toy pistols do not cultivate their aim by practice at marks, and revolvers are of little or no use in modern fighting. Such weapons as that with which the boy of whom we have written killed himself are simply dangerous and their danger is not confined to those who use them and to the circle of their friends and playmates—it is shared by those who have no acquaintance with the person who causes the discharge. As a means of committing suicide the cheap pistol has the merit of not being infallible, but it attracts by its reputation for causing a speedy death and possibly by its association with the phrase "blowing his brains out," which figures largely in the literature that the brainless peruse.

THE HEALTH OF CANNES.

THERE has been a good deal of typhoid fever all along the Riviera from San Remo to Marseilles during the last two or three years and it is very interesting to note how, having spared Cannes so long, an epidemic has at length declared itself at that place. There are four factors to be considered as influencing the sanitary condition of Cannes—(1) the water-supply, (2) the main drainage system, (3) the floricultural industry with its incessant irrigation and manuring, and (4) the turning up of considerable areas of earth. As regards the water-supply Cannes has a supply of most excellent water which comes straight from the limestone hills above Grasse some 30 miles away. Unfortunately it is brought in a canal which is practically uncovered and passes through or near many villages or farms from which fæcal pollution is quite possible. For more than 20 years the English medical men at Cannes, supported by one or two of their most scientific and far-seeing French colleagues, have been pressing upon the town council the necessity of either covering in this canal or making another for supplying the town with pure drinking-water in pipes. They have so far succeeded that a plan is now before the town council for bringing a supply of pure water in pipes from the river Loup which is not very far from Cannes and the water of which is beyond suspicion. But, as usual, there are many members of the council who are unwilling to spend money except for additional amusements, or theatres, or a casino, or ornamental buildings, or advertisements which they suppose will attract strangers to Cannes. The main drainage system which was undertaken by the town council under great pressure from the English residents and medical men, has never been completed. The intercepting drain, which was to have been furnished with powerful pumps and to have conveyed the sewage to be discharged into a deep current of the sea at a safe distance from the town, has never been made; the various collecting drains therefore discharge into the bay of Cannes at a short distance from the shore. There is, too, no proper supervision of the junction of house drains with the main drainage system. The natural vegetation of Cannes and the Riviera consists of olives and fir trees. These flourish with comparatively little water. They are gradually being used up for fuel and their place is being taken by florists' flowers which now form the chief industry of the coast and which require constant irrigation and manuring (partly with human excreta, the contents of cesspools, and the like). All along the Riviera during the last few years there has been a great deal of earth-turning and road-making which has brought to the surface much sewer-tainted earth, and this seems to have opened the door in some way to the epidemic of typhoid fever. The construction of roads and sewerage at Mentone was followed by the outbreak of typhoid fever.

The making of new roads and houses at San Remo was accompanied by typhoid fever from which two of the English medical men suffered. At Antibes the old fortifications were levelled and typhoid fever appeared; at Nice the excavations for the large hotels, the new drainage, and the railway to Grasse were followed by a great outbreak of the disease; and now at Cannes where a large surface of sewer-polluted land has been turned up for the railway works and the building of the Palais de Justice this outbreak of typhoid fever takes place. About 20 years ago the Crédit Lyonnais made an immense boulevard from Cannes to Cannet and a large area of earth had to be upturned and at that time occurred the last epidemic of typhoid fever. With regard to the immediate cause of the present outbreak the French medical men are divided. One party declare that the fever is nothing, that it is not typhoid, and that it cannot be due to water pollution and will not allow that money should be expended on such useless improvements as drains and waterworks; the other party, more broad-minded, think that they have traced the outbreak decidedly to the water-supply and are doing their best with their foreign *confrères* to hasten the completion of the new drinking-water canal. Probably the epidemic has been led up to by various circumstances and conditions which are common to the whole Riviera. The effluvia which have been constantly at work from the use of human excreta for manuring the plants, from the turning up of sewer-polluted ground, and the smells from the badly kept dairies have reduced the power of those exposed to them to resist any typhoid poison. This poison has been supplied either through the drinking-water or by the eating of uncooked vegetables and fruit which have been watered with human excreta, or perhaps by typhoid germs blown from the innumerable establishments of horticulture which poison the beautiful air of the Riviera in all its most desirable quarters. Cannes would be the healthiest town on the Riviera if only—(1) the drinking-water could be conveyed in pipes; (2) the main drainage could be finished and the pumping machine brought into use as proposed; (3) the dairies could be properly supervised and the stalls kept cleaner; and (4) proper laws could be made to regulate the manuring of the floricultural establishments: (*a*) as to the hours during which the manures might be applied; and (*b*) as to the covering of the manure with earth or mixing it with disinfectants when it is applied.

THE DISTRIBUTION OF PLAGUE.

A TELEGRAM from the Governor of Cape Colony, received at the Colonial Office on July 18th, states that for the week ending July 13th the cases of plague at the Cape were as follows: Malays, 2; native, 1; Europeans, coloured persons, Indians, and Chinese, 0; total 3. There were no corpses found. The deaths are as follows: 2 occurred among Malay and none among other nationalities. The total cases of plague up to July 13th were: Europeans, 185, coloured persons, 330; Malays, 61; Indians, 11; Chinese, 1; natives, 142; total 730. The total deaths for July 13th numbered: Europeans, 43; coloured persons, 175; Malays, 44; Indians, 9; Chinese 0; natives, 61; total, 332. At Port Elizabeth the cases for the week ending July 13th were: Europeans, 1; coloured persons, 1; natives, 3; total, 5. One coloured person died. The total cases to July 13th were: Europeans, 7; coloured persons, 5; Indians, 1; Chinese, 1; natives, 14; total, 28. The total deaths numbered 10, and the total cases of plague at all other places were 10, of which number 5 were Europeans. A second case of plague in an Indian from the remount camp at Port Elizabeth has occurred among persons under naval and military control and the area of infection remains unchanged. A telegram from Mauritius, received on July 19th, states that in the week ending July 18th a fatal case of bubonic plague occurred. As regards Egypt, for the week ending July 14th only 3 cases of plague and 1 death from the disease have occurred throughout all Egypt. Zagazig furnished these cases. The present situation with regard to the plague in Egypt may be considered extremely satisfactory, and we trust that before long the disease will have completely disappeared. The disinfection and cleansing of the towns infected, it appears, are being thoroughly carried out. In Hong-Kong for the week ending July 20th there were 13 cases of plague reported and 16 deaths.

THE PROPOSED LEGISLATION ON BAKEHOUSES.

OF course it is to the interest of the public at large that the bread which we consume should be made in clean and wholesome bakehouses, but some consideration should also be given to the comfort and health of the journeymen bakers who are engaged in kneading our daily supply. It is possible, though perhaps not very probable, that an underground bakery may be quite clean and that there may be no open drain in its immediate vicinity. On the other hand, the efficient ventilation of an underground bakery must be a matter of great difficulty and the room is not likely to be sufficiently lofty. The insanitary conditions of such bakehouses were described and denounced in a report by our Special Commissioner which was published in THE LANCET of Nov. 30th, 1889, page 1140. We then also stated that the secretary of the Journeymen Bread and Biscuit Bakers' Pension Society informed us that 14 out of 18 men, then receiving pensions, were more than five feet eight inches in height. This was no exception but the general rule. A short man's head would be in the line of the draught going to the oven furnace. A tall man's head would be above this draught and nearer the ceiling where the vitiated air stagnates. In view of this circumstance there should be apertures or ventilating shafts along the ceilings. In any case the bakehouses should be lofty so that even tall men would not respire from the layer of vitiated air. Naturally, it is much more difficult to obtain such conditions in a cellar than in a bakehouse built above ground. The other disadvantages of underground bakehouses are better known and appreciated by the public at large and have been often denounced, so that altogether there can be no question but that their total abolition would be a great boon to the public in general and to the journeymen bakers in particular. We are therefore pleased to note that the Government Bill to amend the Factory and Workshop Act proposes in Clause 28 that after Jan. 1st, 1904, underground bakehouses shall not be used unless certified by the district council as suitable for that purpose. "Underground" is defined as a room with a floor that is more than three feet below the level of the roadway, but even such bakehouses will not be abolished if they obtain a certificate. The worst of this enactment is that its success depends on not only the energy but also on the technical knowledge of the district councils. If such a matter is left to their discretion, many abuses, we fear, will still survive and there will be no uniformity. A committee of experts should draw up model plans, giving illustrations of typical cellar bakehouses and showing how these can be altered in a satisfactory manner; for it seems to be the opinion of the framers of the Bill that this is possible. Certainly, we can conceive that a bakehouse which has its floor four feet instead of three feet below the level of the street might be fairly ventilated and healthy if the wall, or rather the ceiling, was six feet above the street. In these six feet of space above ground,

four feet of which would be above the head of a tall man, a thorough draught might be established and effective ventilation secured. But will all the district councils be technically capable of securing these advantages, unless they are taught and stimulated to take energetic action by a more competent central authority? In any case, some good will undoubtedly result, though its extent will vary in different places, according to the intelligence and activity of the local authorities. Yet an attempt was made to delay even this measure of reform, and it was proposed that Clause 28 should not be applied till Jan. 1st, 1906. Fortunately, Mr. John Burns energetically opposed such adjournment, and quoted some of THE LANCET reports to show how great were the existing evils. Sir Henry Fowler and other members of the Grand Committee of the House of Commons, we are pleased to see, supported Mr. Burns, and finally Mr. Ritchie declared that he would adhere to the date originally proposed—namely, Jan. 1st, 1904.

EQUINE SUN-BONNETS.

THE use of the sun-bonnet as a head covering for the horse during the intense heat of summer is much more noticeable this year in our streets than it has been previously. The idea is unquestionably a good one and, although it was very much ridiculed some two years ago when it was first introduced, it has undoubtedly come to stay. Several of our great omnibus companies and the owners of other large studs have adopted them universally, and the general consensus of opinion is that cases of sunstroke and heat apoplexy are of much less common occurrence in consequence. In devising a sun-bonnet there is no need to carry the idea to an absurd point; what is really needed is a covering slightly raised from the head which will protect the poll and base of the brain from the direct rays of the sun. The ears should be left free, and ribbons and tassels, although perhaps adornments, are not a necessity. Straw seems to be the favourite material, but we have seen several very good patterns made up of light calico spread over a wire framework. As equine sun-bonnets can be obtained for as small a sum as 2½*d.* (with a probable reduction on taking a quantity) the cost is not prohibitive and there is no reason why the coster's donkey should not be as effectually protected as the gentleman's carriage-horse.

ANKYLOSTOMIASIS.

MR. C. LE NEVE FOSTER, D.Sc., F.R.S., in his report just issued for 1900 as His Majesty's Inspector of Mines for the North Wales, &c., district, makes the following interesting allusion to this disease: "When I learnt that the company owning the Frongoch mine in Cardiganshire had imported a number of Italian workmen it occurred to me that they might unwittingly be the means of introducing ankylostomiasis, or miners' anæmia, into this country. I at once put myself into communication with the mine doctor, who reported to me that certain of the men were unwell, and possibly suffering from this disease. I obtained samples of their evacuations, and with your permission transmitted them to Dr. Malvoz, of the Bacteriological Institute, Liége, who has had much experience in searching for the obnoxious parasite among miners in his own country. I was glad to learn from him that, after careful investigations, he had come to the conclusion that the men were free from the disease. Though there is little chance of the eggs being hatched and the disease being propagated in the comparatively cold workings of Frongoch it is quite possible that infested foreign workmen may go into other mines which afford such conditions of warmth and dampness as are necessary for hatching the larvæ. Here there would be danger and seeing the havoc which the malady has caused among miners on the Continent it is well for the British employer to be on his guard. For my own part I would not employ a foreign workman below ground in a warm and damp mine until I had satisfied myself by a simple microscopical examination that he was free from the troublesome worm. It is in no spirit of hostility to Italian workmen that I make this remark. I lived among them for three years and know from experience that many of them are hard-working and excellent miners; it is, moreover, to their own advantage to be freed from the troublesome intruder and there is no reason why they should not be employed at the surface until the mine owner has satisfied himself that they are clear of it." The importance of the ankylostomum duodenale is very great for the anæmia to which it gives rise is extremely severe and often fatal. In countries in which it is endemic a very large proportion of the inhabitants are affected, and Dobson found it in India in the stools of 75 per cent. of persons to whom he had administered thymol and it is said to be discovered in the intestine at nearly every post-mortem examination in Egypt. The disease, according to Cobbold, is not endemic in this country and therefore every effort should be made to exclude it. Fortunately we have in thymol, if properly administered, a very efficient means of treatment, though it must not be given with any liquid which will dissolve it, for otherwise severe symptoms of poisoning occur.

FEVER IN SYPHILIS.

IN syphilis fever of such degree as to attract attention seldom occurs, but the subject is well worthy of investigation. The *New York Medical Journal* of June 22nd contains an important paper by Dr. Thomas B. Futcher, which includes descriptions of three cases from the clinic of Professor Osler in the Johns Hopkins Hospital. Syphilitic fever may occur—very rarely—three or four weeks before the secondary eruption. It may precede or concur with the secondary eruption. This is the so-called "fever of invasion" and is a common and important symptom of secondary syphilis. Finally, fever may occur at any time during the secondary or tertiary stages. The "fever of invasion" is rarely absent at the onset of the secondary symptoms. It usually precedes the eruption by a week or 10 days and is accompanied by headache, malaise, and general pains. It may be moderate, not reaching 101° F., or the afternoon elevation may be as high as 104° or 105°. The pyrexia may be of a continuous, remittent, or intermittent type. Case 1.—A married woman, aged 34 years, was admitted to hospital on Sept. 28th, 1900, complaining of abdominal pain which had begun three weeks before. On the previous night she had a rigor which was followed by sweating. On Sept. 29th and 30th the temperature ranged between 98·7° and 101° F. On Oct. 1st a pelvic abscess, which possibly was the cause of the fever, was evacuated per vaginam. The temperature failed to fall and on Oct. 4th, after a rigor and profuse sweating, it rose to 104·2°. There was slight erythema. One of the acute exanthemata was thought to be developing. The temperature fell slowly and had not reached normal before another febrile exacerbation occurred (on Oct. 6th), 105·5° being reached. It fell rapidly and reached normal on Oct. 7th. A third exacerbation took place on the 9th and a fourth on the 14th. From this time the temperature gradually fell, but there were slight evening elevations. No cause for the pyrexia could be found in the pelvis or elsewhere. The character of the fever suggested æstivo-autumnal malarial infection, but repeated examinations of the blood failed to show parasites. The spleen was palpable, but Widal's reaction was negative. As the temperature was elevated only about 1° every day the patient was discharged practically well on Oct. 21st. She returned on the 30th with a macular

and papular syphilitic eruption. Inquiry showed that her husband had been under treatment for a chancre on August 11th and that he had a syphilitic eruption on August 27th. No history of primary sore in the patient could be obtained. It is noteworthy that the eruption did not appear until practically four weeks after the onset of fever and when the temperature had subsided to normal for some time. (A similar case was recorded by Dr. Burney Yeo in the *British Medical Journal* in 1884 (vol. i., p. 317). The patient had fever ranging as high as 104° or 105° F., with daily oscillations of 5° or 6°, which began from 25 to 30 days after exposure and from three to four weeks before the appearance of the secondary eruption.) Case 2.—A man, aged 39 years, was admitted to hospital on August 8th, 1894, complaining of pains all over the body. For three weeks he had felt feverish and had been unable to work. For a week he had had nausea, vomiting, and diarrhœa. The spleen was felt four centimetres below the ribs. Examination for malarial parasites was negative. The temperature at 8 P.M. was 103·4° F.; it ran a remittent or intermittent course, being 102° or 103° in the evenings. Typhoid fever was prevalent and the case was treated as such. On Sept. 12th it was noticed that both clavicles towards their sternal ends were remarkably thickened and bowed. The patient said that he had had a sore on the prepuce. Iodide of potassium was given in 15-grain doses thrice daily and the dose was gradually increased. The effect was striking. From Sept. 13th the temperature gradually fell. On the 16th it became normal and so remained. The patient was discharged on Oct. 13th feeling well. Case 3.—An unmarried man, aged 57 years, was admitted to hospital on August 24th, 1892, complaining of chills and fever. He contracted syphilis in 1864 and had a number of tertiary ulcers. On June 15th, 1892, several sores appeared on the body. About the end of July recurring chills with temperatures of from 102° to 104° F. began. They were thought to be malarial but did not yield to quinine. Two weeks before admission tenderness and swelling developed over the sternum and in the left shoulder-joint. Iodide of potassium was given. On admission the chills had ceased, but there were evening elevations of temperature to 101°. Under the iodide the temperature gradually became normal. Syphilitic fever is thus liable to be mistaken for a number of conditions—malarial, typhoid, and other acute fevers, tuberculosis, and acute rheumatism. Hence in all obscure cases of fever syphilis should be looked for.

ARGYLL-ROBERTSON PUPILS AS AN EARLY SIGN OF SYPHILITIC DISEASE OF THE NERVOUS SYSTEM.

AT the meeting of the Société Médicale des Hôpitaux of Paris on May 17th M. G. Babinski and M. Charpentier communicated an important paper on this subject. In a previous publication they endeavoured to establish that permanent abolition of the pupillary reflexes, particularly of the light reflex, is a sign almost, if not completely, pathognomonic of acquired or inherited syphilis.[1] They presented four patients illustrating this view. Case 1.—A woman, aged 34 years, had acquired syphilis at the age of 27 years. She had nodes and Argyll-Robertson pupils. There were no signs of organic nervous disease, the tendon reflexes were normal, sight was good, micturition was normal, Romberg's sign was absent, and there had never been any pain. Case 2.—A woman, aged 48 years, contracted syphilis at the age of 16 years. The pupils responded to accommodation but not to light. There was no other sign of nervous disease. Case 3.—A man, aged 46 years, contracted syphilis at the age of 31 years. Argyll-Robertson pupils were the only sign of nervous disease present, but, contrary to the preceding cases, the patient had suffered for several months from lancinating pain and his memory was becoming enfeebled. Case 4.—A woman, aged 52 years, had Argyll-Robertson pupils. There was no other sign of nervous disease or history of syphilis, but she had had one abortion. Since infancy she had had "sabre-shaped tibiæ." Hereditary syphilis was thought probably to be present. M. Babinski and M. Charpentier think that the abolition of the pupillary reflex in such cases is a sign that the central nervous system has been attacked by syphilis and that the patient is "a candidate for locomotor ataxy, general paralysis, or confirmed cerebro-spinal syphilis." The interval between the appearance of the sign and the development of other signs of these diseases may be very brief or may be prolonged indefinitely. There are cases intermediate between the types of these diseases in their completely developed form and those cases in which abolition of the pupillary reflex is the sole sign of nervous disease. Case 3 is an example. As Argyll-Robertson pupils, which are of such high value in the diagnosis of early syphilis of the nervous system, may be present without loss of vision they are not likely to attract the attention of the patient. Hence they should be looked for systematically by the practitioner. Their recognition is of great importance. They reveal the existence of a state which is often the precursor of grave troubles and imperatively demands specific treatment. This early stage is the most favourable time for the treatment of syphilitic nervous disease.

[1] Bulletin de la Société de Dermatologie, June 13th, 1899.

TREATMENT OF INSOMNIA AND DELIRIUM DUE TO COMBINED ALCOHOLISM AND NICOTINISM.

A REMARKABLE case of insomnia and delirium due to combined alcoholism and nicotinism is recorded by Dr. John E. Beebe of Chicago in the *Journal of Nervous and Mental Diseases* for June, together with the results of treatment. The case was that of a man, aged 34 years, married, and of good family. He had been placed in a sanatorium to undergo treatment for the abuse of whisky and cigarettes. The result of enforced abstinence was that he quickly passed from a state of relatively good health into a condition of furious delirium, difficult to control, and attended by marked insomnia; for two weeks he had been under continual supervision, and he was at length showing symptoms of cerebral exhaustion. His history was that he had smoked on an average from 40 to 80 cigarettes per diem since he was 18 years of age. "During the six weeks he was under my care," says Dr. Beebe, "a steady pitch-like flow of disagreeable odour oozed from his nicotine-stained hands." The young man, a son of luxury, had been drinking excessively for over six years, and his digestive and intestinal functions were considerably disordered and impaired. A diagnosis of alcoholic delirium, complicated with profound nicotinism, was made. The chief difficulty was to induce rest and quiet in the patient who was delirious, restless, roaming about his room, and gibbering without being still even for a few minutes. Morphine was given both hypodermically and by the mouth but without effect. The bromides were likewise ineffective, and chloral seemed only to add to the frenzy of the already exhausted patient. Having obtained a slight relief with trional it was now determined to push this drug. Doses of from 10 to 30 grains were given at first, but after a few trials 15 grains every four hours and up to 90 grains per diem were given. At first his restlessness and delirium continued with slight remissions, the culminating point of his disorder being reached once when he lay restless and sleepless for 36 hours in spite of everything that could be done. At this stage the patient was treated with hot-water packs, the hottest that he could endure, and held firmly in bed, while

during 24 hours he was treated with trional to the total extent of 117 grains. After this he went to sleep for about 20 hours. Henceforth from time to time he was given large doses of the same drug, while the strongest stimulants were given hypodermically to keep his failing heart up to its work, especially as the patient had suffered for over a year from a weak heart which at one time caused much anxiety when he was undergoing a surgical operation a year previously. After a period of six weeks of the above treatment he recovered, his body-weight, however, showing a loss of about 30 pounds. The temperature during the earlier half of the period varied from 101° to 103° F. No single bad effect was observed from the large doses of trional with which he was treated, the aggregate quantity administered up to the beginning of convalescence being several ounces. From the above and a number of other cases Dr. Beebe concludes that "if attention is paid to elimination, if liquid foods are freely and regularly used, and if the heart is kept in the best possible condition," trional will prove successful in the treatment of such cases as the above.

IS ICE INNOCENT?

ALLEGATIONS have from time to time been made against ice as a possible source of infection, and in 1893 we instituted a practical inquiry upon the subject so far as it related to the London ice-supply. The results on the whole were of a reassuring character in the light both of chemical and bacteriological examination. It was shown that certainly not less than nine-tenths of the ice sold in London were obtained from small lakes and ponds in Norway, situated in such solitary and secluded sites as to render any contamination with animal matters highly improbable. According to a fresh inquiry commenced last week, we still find that most of the ice supplied in London shops is Norwegian ice and, moreover, that it is of excellent quality, pure, sparkling, and clean. There might, of course, be exceptions to this. The water which was yielded on melting contained less than a grain per gallon of dissolved mineral matter, no nitrogen either in organic or mineral shape, and but a trace of chlorides. In short, the composition of the ice-water approached very nearly to that of distilled water or of the water of mountain streams. It was very soft and very pure. There were a few ordinary and harmless species of water bacteria present. These results are excellent and show that the Norwegian ice-supply is highly satisfactory and that no harm is likely to accrue even when the ice is consumed as it is when placed in beverages for cooling purposes. One curious fact came to light during our experiments and that was that if the ice be allowed to melt in a leaden vessel the resulting water was found to contain a very appreciable amount of the poisonous metal. This is not surprising when we consider how very soft Norwegian ice-water is, but it affords the important lesson that care should be taken not to keep melting ice in leaden vessels or to allow it to come into contact with lead in any way.

THE SUSPECTED CASES OF PLAGUE AT PLYMOUTH.

THE circumstances connected with the arrival of the *Ormuz* at Marseilles were sufficient to raise a suspicion that there had been, or were, cases of plague on board. The *Ormuz* left Sydney on June 8th and touched on her homeward journey at the usual ports of call. She carried a crew of 160 Europeans and 174 passengers. It appears that on July 5th a coal-trimmer who had shipped at Sydney developed inguinal buboes and certain other symptoms suspicious of bubonic plague, and on July 17th another of the crew noticed an axillary swelling, which, however, may have had as its cause a burn on the finger. Both cases were, it seems, regarded with suspicion, and as the restrictions sought to be imposed upon the *Ormuz* at Marseilles were somewhat onerous, the captain elected to forthwith proceed to sea. Both patients have now, we understand, been isolated in the port sanitary hospital at Plymouth, and, although the local bacteriologist has had some suspicions as to the real nature of the disease, it is not improbable that the cases may eventually be regarded in a negative light. However this may be, the patients are comfortably housed, or rather shipped, in Plymouth Sound, and are not likely to be the means of infecting the town itself.

THE Royal Commissioners appointed in 1898 to inquire into and to report as to what methods of treating and disposing of sewage may properly be adopted have issued a preliminary document in which they deal with some of the more urgent questions on the subject. With certain reservations they doubt if any land is entirely useless for the purpose. They are satisfied that satisfactory effluents can be produced by bacteriological methods in many instances without interposing land treatment. They suggest the creation of a new department of the Local Government Board—"a supreme rivers authority"—to deal with the pollution and purification of rivers and to keep local authorities up to a strict sense of their duty in these matters.

THE deaths are announced of two noteworthy medical men. The name of Mr. Carsten Holthouse, who died in his ninety-first year, stood first on the chronological list of the Fellows of the Royal College of Surgeons of England. Dr. E. S. Morley was a prominent practitioner in Blackburn and was an elder brother of the Right Hon. John Morley, M.P. We hope to publish obituary notices of both these gentlemen in a future issue.

A DINNER was given in honour of Professor Robert Koch, M.D., by the Royal Institute of Public Health at the Hôtel Métropole on July 24th. The Harben Gold Medal and the Honorary Fellowship of the institution were presented to Professor Koch in recognition of his many notable scientific researches.

MR. MALCOLM MORRIS will deliver the Lane Lectures at San Francisco in the first week in September on the subject of Skin Diseases.

COUNTY OF DURHAM MEDICAL UNION.

THE third annual meeting of this union was held in the Mayor's Chamber at the Town Hall, Durham, on June 28th, Alderman E. JEPSON, M.D. Durh., the President, being in the chair. There was a large attendance of members from Durham, South Shields, Whickham, Jarrow, Low Fell, Gateshead, Bishop Auckland, Sunderland, West Hartlepool, Stockton-on-Tees, Wingate, Stanley, Howden-le-Wear, Sedgefield, Willington, Ryton-on-Tyne, Washington, Sherburn, Easington, and Spennymoor.

The PRESIDENT, in opening the meeting, congratulated the members on this being the third annual meeting. He said that some had predicted an early decline for their union, but rather than decline or signs of decay there were indications and evidences of more stability. It was true that they were not engaged in any sharp conflict at that time, but the union had gradually asserted itself in many places and a higher rate of pay had become recognised in many parts of the county. The position of those directly opposed to the union was becoming worse every day. The President further stated that he and Dr. Alfred Cox (Gateshead) had been invited to a meeting of the Hartlepool Medical Society to explain to the members of that society the objects and aims of the union with a view to

their affiliation with them, and that they attended and so far pleaded their case that two days since he had received a letter from Dr. H. Schmitz, the secretary of the Hartlepool Medical Society, to say that that society had unanimously resolved to become affiliated to the union. This, he considered, was very gratifying, and pointed distinctly to growth and strength in the union. He added that he had repeatedly tried to induce the Darlington Medical Society to become affiliated with them, but hitherto without success. That day, however, he had had a letter from Dr. J. Hern to say that the matter would be further considered in October. There was one more society to be wooed and won, and that was the Gateshead Medical Association. When these two societies had joined them the county union would be nearly complete. In conclusion, he thanked them for their kindness and courtesy during the past year, and begged them most earnestly to use a free and open mind in performing the duty of electing his successor.

Dr. J. F. ARMSTRONG (South Shields) said that he had very great pleasure in moving the re-election as President of Dr. Jepson who had been a great power and help to the society. He had spared neither time nor trouble in furthering their interests.

Mr. W. GALLOWAY (Low Fell) seconded the motion which was carried unanimously.

The PRESIDENT, in returning thanks, said that he did not believe in repeated re-elections, but he could not resist their kindness and would do all in his power to help on the union.

On the motion of Mr. M. A. WARDLE (Bishop Auckland) and Mr. A. W. Attwater (Whickham), Dr. James Murphy (Sunderland) was unanimously re-elected Vice-President.

The following were elected members of the Council: Dr. Armstrong (South Shields), Dr. Cox (Gateshead), Mr. Galloway (Low Fell), Dr. J. H. Hunter (South Shields), Dr. R. S. Hubbersty (Sunderland), Mr. R. E. Ingram-Johnson (South Moor), Dr. C. F. G. Mann (Washington), Dr. G. V. Miller (Stockton), Dr. A. Mackay (Crook), Dr. J. Taylor (Chester-le-Street), Mr. R. Stuart (Durham), Mr. Wardle (Bishop Auckland), Mr. E. S. Davis (Hartlepool), Mr. Arthur (Wingate), Dr. G. Stephen (West Auckland), Mr. K. C. Hill (Jarrow), Dr. J. Charles (Stanley), Mr. Attwater (Whickham), Dr. R. S. Anderson (Spennymoor), Dr. A. D. M. McIntyre (Blackhill), Dr. D. Wilson (Birtley), Mr. A. A. D. Parker (Easington). Dr. Taylor takes the place of Mr. H. Lyon Smith who is leaving the district, Mr Davis takes the place of Mr. W. Nisbet (Thornley) who has retired from practice, and Mr. Arthur takes the place of Dr. W. A. G. Russell who was, it was stated, at the seat of war in South Africa. Messrs. Graham and Shepherd (Sunderland) were re-elected joint secretaries, treasurers, and solicitors. Dr. C. D. Hill Drury (Darlington), Dr. Hern (Darlington), Dr. David V. McIntyre (Brandon), and Mr. Davis (Hartlepool) were elected members.

The treasurers' statement, showing a balance of £66 3*s.* 1*d.* in favour of the union, was submitted and adopted. A sum of £50 was ordered to be paid to the secretaries on account of the balance due to them. Reports were made by representatives from Sunderland, Chester-le-Street, Stanley, Jarrow and Hebburn, Consett, Trimdon, and Stockton, which were generally very satisfactory.

Some discussion took place as to the fixing of a minimum midwifery fee for the county, and Mr. ATTWATER (Whickham) gave notice that at the next meeting he would bring forward a motion fixing the minimum midwifery fee at 15*s.*

Mr. ATTWATER moved:—

That in consequence of the great difficulty frequently experienced in obtaining a reliable assistant or locum tenens we ask Messrs. Graham and Shepherd to act as agents for the purpose and also for negotiating the sale and purchase of medical practices.

Several members expressed themselves in favour of the desirability of such an agency being attached to the union, and the motion was carried unanimously.

Mr. SHEPHERD, on behalf of his firm, promised to give the matter careful consideration. He thought an agency of the kind would be a most useful adjunct to the union.

The SECRETARIES reported that the resolution unanimously passed at the general meeting on Feb. 5th requesting the General Medical Council to remove from the Register any medical practitioner who countenanced or encouraged canvassing by any union or association of working men and others on his behalf had been brought before the Executive Committee of the General Medical Council on June 3rd, but that no action was taken thereon. Great disappointment was expressed at the lack of interest in matters affecting the general practitioner thus displayed by the General Medical Council, and it was unanimously resolved, on the motion of Mr. ATTWATER, seconded by the VICE-PRESIDENT, and supported by Dr. ARMSTRONG, Dr. CHARLES, and Mr. ARTHUR, that the resolution should be again sent to the General Medical Council and that Mr. G. Brown, Mr. Victor Horsley, and Dr. J. G. Glover should be specially asked to give it their support.

A reprint of the rules with the amendments made since the first issue was ordered; and on the motion of the PRESIDENT, seconded by Dr. ARMSTRONG, it was agreed that a half-yearly letter or report should be sent out in the months of March and October to all the members, giving a short statement as to the work which had been done and of the meetings held, and as to any resolutions, &c., passed, so as to keep the members in touch with the executive.

Considerable interest was evinced in the question of the fees paid by insurance companies for medical examinations and it was decided that the matter should be further considered at the next meeting. The PRESIDENT said that he would give notice of a proposition which he would move on the subject.

A hearty vote of thanks to the President brought a successful meeting to a close.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 33 of the largest English towns 6377 births and 3927 deaths were registered during the week ending July 20th. The annual rate of mortality in these towns, which had been 15·1 and 15·6 per 1000 in the two preceding weeks, further rose to 17·9 per 1000 last week. In London the death-rate was 16·2, while it averaged 19·0 in the 32 large provincial towns. The lowest death-rates in these towns were 7·7 in Croydon, 8·4 in Brighton, 11·9 in Hull, and 12·0 in Cardiff; the highest rates were 22·5 in Blackburn, 29·1 in Birkenhead and in Sheffield, and 30·5 in Liverpool. The 3927 deaths in these towns last week included 897 which were referred to the principal zymotic diseases, against 431 and 567 in the two preceding weeks; of these, 616 resulted from diarrhœal diseases, 103 from measles, 62 from diphtheria, 49 from whooping-cough, 35 from "fever" (principally enteric), 32 from scarlet fever, and not one from small-pox. No death from any of these diseases was registered last week in Brighton; in the other towns they caused the lowest death-rates in Croydon, Wolverhampton, and Hull, and the highest in Birkenhead, Liverpool, and Sheffield. The greatest mortality from measles occurred in Leeds and Birkenhead; from scarlet fever in Blackburn; from whooping-cough in Newcastle and Swansea; and from diarrhœa in Preston, Leeds, Birkenhead, Sheffield, and Liverpool. The mortality from "fever" showed no marked excess in any of the large towns The 62 deaths from diphtheria in the 33 towns included 30 in London, five in Leicester, five in Manchester, five in Salford, and four in West Ham. No fatal case of small-pox was registered in any of the 33 towns; five small-pox patients were admitted into the Metropolitan Asylums hospitals during the week, and 14 remained under treatment on Saturday, July 20th. The number of scarlet fever patients in these hospitals and in the London Fever Hospital at the end of the week was 2907, against numbers increasing from 1522 to 2918 on the 12 preceding Saturdays; 371 new cases were admitted during the week, against 408, 363, and 324 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 165 and 133 in the two preceding weeks, rose last week to 135, but were 35 below the corrected average. The causes of 49, or 1·2 per cent., of the deaths in the 33 towns were not certified, either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Bristol, Salford, Bradford, Cardiff, Sunderland, and Oldham, and in 10 other smaller towns; the largest proportions of uncertified deaths were registered in Leeds, Sheffield, Birmingham, and Liverpool.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 19·0 and 17·2 per 1000 in the two preceding weeks, rose again to 18·4 per 1000 during

the week ending July 20th, and was 0·5 per 1000 above the mean rate during the same period in the 33 large English towns. The rates in the eight Scotch towns ranged from 14·2 in Perth and 14·8 in Aberdeen to 19·1 in Edinburgh and 22·6 in Dundee. The 585 deaths in these towns included 45 which were referred to diarrhœa, 25 to whooping-cough, 24 to measles, four to scarlet fever, and three to "fever." In all, 101 deaths resulted from these principal zymotic diseases last week, against 81 and 89 in the two preceding weeks. These 101 deaths were equal to an annual rate of 3·2 per 1000, which was 0·9 per 1000 below the zymotic death-rate last week in the 33 large English towns. The fatal cases of diarrhœa, which had been 24, 19, and 29 in the three preceding weeks, further rose last week to 45, and included 26 in Glasgow, six in Edinburgh, five in Dundee, four in Aberdeen, and three in Paisley. The deaths from measles, which had been 25, 25, and 22 in the three preceding weeks, rose last week to 24, of which 17 occurred in Glasgow and six in Dundee. The fatal cases of whooping-cough, which had declined from 30 to 25 and 22 in the three preceding weeks, rose again last week to 25, and included 11 in Glasgow, 10 in Edinburgh, and three in Dundee. The deaths from scarlet fever, which had been seven in each of the two preceding weeks, fell last week to four, all of which were registered in Glasgow. The deaths from "fever," which had been one and six in the two preceding weeks, fell last week to three, which were all registered in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had been 95 and 75 in the two preceding weeks, rose last week to 79, but were one below the number in the corresponding period of last year. The causes of 23, or more than 4 per cent., of the deaths in these towns last week were not certified.

HEALTH OF DUBLIN.

The annual rate of mortality in Dublin, which had been 20·7 and 21·0 per 1000 in the two preceding weeks, declined again to 18·4 during the week ending July 20th. During the past four weeks the death-rate has averaged 19·6, the rates during the same period being 14·7 in London and 17·1 in Edinburgh. The 132 deaths of persons belonging to Dublin registered during the week under notice were 19 fewer than the number in the preceding week, and included 18 which were referred to the principal zymotic diseases, against seven and 10 in the two preceding weeks; of these 14 resulted from diarrhœa, two from fever, one from diphtheria, and one from scarlet fever. These 18 deaths were equal to an annual rate of 2·5 per 1000, the zymotic death-rate during the same period being 2·9 in London and 2·8 in Edinburgh. The deaths from diarrhœa showed a considerable excess over the numbers recorded in recent weeks. The 132 deaths in Dublin last week included 24 of infants under one year of age and 33 of persons aged upwards of 60 years; the deaths of infants were about equal to the average in recent weeks, and those of elderly persons were rather below the average. Ten inquests were held and seven deaths from violence were registered; and 48, or more than one-third, of the deaths occurred in public institutions. The causes of four, or more than 3 per cent., of the deaths in Dublin last week were not certified.

THE SERVICES.

ROYAL ARMY MEDICAL CORPS.

MAJOR J. J. P. DOYLE has arrived at Brighton for duty and taken over medical charge of the Station Hospital, vice Lieutenant-Colonel J. J. Crean, A.M.S. Lieutenant Adderley is transferred from the Poona District to the Bombay District. Major John Osburne to be Surgeon-Lieutenant. Dated July 20th, 1901.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant Leonard Leighton Hanham, 2nd Devonshire Volunteer Artillery, to be Surgeon-Lieutenant. Dated July 20th, 1901.

VOLUNTEER CORPS.

Artillery: 7th Lancashire (the Manchester Artillery): Surgeon-Major R. A. S. Daly to be Surgeon-Lieutenant-Colonel. Dated July 20th, 1901. *Rifle:* 1st Cadet Battalion the Royal Fusiliers (City of London Regiment): Arthur Robert Owst to be Surgeon-Lieutenant. Dated July 3rd, 1901. 1st Volunteer Battalion the Lincolnshire Regiment: Surgeon-Captain G. M. Lowe to be Surgeon-Major. Dated July 20th, 1901. 3rd Volunteer Battalion the Royal Welsh Fusiliers: Second Lieutenant John Robert Williams resigns his commission, and is appointed Surgeon-Lieutenant. Dated July 20th, 1901. 1st (Pembrokeshire) Volunteer Battalion the Welsh Regiment: David Arthur Hughes to be Surgeon-Lieutenant. Dated July 20th, 1901. 6th Volunteer Battalion the Gordon Highlanders: Surgeon-Lieutenant T. A. Sellar to be Surgeon-Captain. Dated July 20th, 1901.

SOUTH AFRICAN WAR NOTES.

The following have been discharged from hospital for duty:—Civil Surgeons: John Brodie Boyd and Hamilton Arthur Stewart. The following are on passage home: Civil Surgeons: J. Sowden and J. W. Miller.

AFFAIRS IN SOUTH AFRICA.

A great deal has taken, and is taking, place since we last chronicled the course of events in South Africa, some of which has an important prospective bearing on the war, while much is of more or less medical interest. The capture and publication of the Reitz-Steyn correspondence come under the first category. It discloses a disorganised state of things in regard to the Boers and their Governments which has been long suspected and it serves to demonstrate the necessity of a vigorous prosecution of our military policy by mounted troops if we would overcome resistance and put an end to hostilities. While we can all be touched with a feeling of pity in connexion with the circumstances attending the illness and death of Mrs. Kruger at Pretoria, separated by so many miles from her husband, and the grief which her death has naturally caused to Mr. Kruger, this country has nevertheless the satisfaction of feeling that all that kindly consideration and forbearance could do for Mrs. Kruger was done. With regard to the concentration camps the Government have appointed a committee of ladies to inquire into and to report upon the arrangements made by the military and medical authorities. We imagine that this is the first time that such a step has been taken. In addition to the casualties from repelling attacks by the Boers in their various raids, there are still rather long lists of sick from various causes incidental to war and camps. There has been a reception at Marlborough House by the King of a deputation of American ladies to present His Majesty with a memento of the work done by the American hospital ship *Maine* for the sick and wounded in South Africa and China in 1900 and 1901. A gold medal, which had been designed and struck for the purpose of presentation to Her late Majesty Queen Victoria was offered to, and accepted by, the King. The *Maine* was at the end of her work, it will be remembered, presented to the British Government.

VITAL STATISTICS OF THE GERMAN NAVY, 1897–1899.

A biennial statistical report on the Imperial German Navy has been issued for the period ending March 31st, 1899. It is a voluminous document, comprising 315 pages, and contains a large amount of valuable and well-arranged matter in addition to numerous tables and diagrams. In the first half of the biennium the average strength, afloat and ashore, was 22,692 men, but during the second twelvemonth it rose to 27,067, an increase of nearly 20 per cent. The general admission-rate, at home and abroad, was 790 per 1000 per annum for the two years, which was about the same as that prevailing among the German land forces. The average time under treatment was 16·5 days per case, and 37 men were constantly sick out of each 1000. The first year the death-rate was 3·5 per 1000, but the second year it fell to 2·8 per 1000, the average for the two years being consequently 3·15 per 1000. This very low mortality compares favourably with that of all the other navies publishing statistics, but in gauging its true value the invaliding-rates must be taken into account. In 1887–88 the average number of men invalided from the German navy was 14 per 1000, whereas in the first of the two years under report the loss from this cause was 40 per 1000 and in the second 38 per 1000. The revaccinations during the biennium amounted to 19,884, and in no fewer than 12,935 instances, being 65 per cent. of the whole, the operation was successful. Of the failures 5201 were again vaccinated, some for a fourth or fifth time, success attending on 29 per cent. of the attempts. The capital operations performed during the period were

84 in number. Among them there were two trephinings (both successful), four laparotomies (two deaths), four operations for appendicitis (all successful), 13 operations for the radical cure of hernia (all likewise successful). 23 sick men were sent for treatment to Wiesbaden, Aix, Oyenhausen, and Teplitz, their disabilities being mostly chronic rheumatism, sciatica, and syphilis.

DEATHS IN THE SERVICES.

Surgeon-Major Frederick Robinson, at his residence at Eastbourne on July 21st. He entered the service as Assistant Surgeon in the 74th Foot and was transferred to the Scots Fusilier Guards in 1852. He became Surgeon-Major of the battalion in 1867. He accompanied the Scots Fusilier Guards to the Crimea and served with the battalion until the termination of the war. He was present at the battles of the Alma, Balaclava, and Inkerman and at the siege and fall of Sebastopol and the sortie of Oct. 26th (British medal with four clasps, Medjidieh and Turkish medals). Surgeon-Major Robinson was the author of "A Diary of the Crimean War."

GENERAL BADEN-POWELL'S HOSPITALS.

The generous donors of literature and subscriptions to Lady Sarah Wilson's fund for supplying books to the South African Constabulary Hospitals will be glad to know that the final consignment of about 700 volumes is being shipped this week, thus carrying out General Baden-Powell's personal wish expressed in a letter to Lady Sarah Wilson as follows: "My idea was to make up the books into cases of say 50 to 100 volumes in strong, locked travelling cases. A case would be sent to each hospital for a month and then passed on to the next hospital. In this way there would be a monthly arrival of a fresh lot of books."

HONOURS FOR CHINA AND SOUTH AFRICA.

Colonel J. T. B. Bookey, I.M.S., has been appointed a Companion of the Bath for services rendered during the recent operations in China, and the following officers have been appointed to Companionships of the Order of the Indian Empire for services in the same operations: Lieutenant-Colonel W. J. R. Rainsford, R.A.M.C., Major J. J. C. Watson, R.A.M.C., and Lieutenant-Colonel L. A. Waddell, I.M.S.

The King has appointed Deputy Surgeon-General H. J. Blanc to be Knight Commander of the Royal Victorian Order.

Sir William Thomson, C.B., has been appointed a member of the Army Medical Reorganisation Committee.

Correspondence.

"Audi alteram partem."

"THE CONTAMINATION OF POST-OFFICES."

To the Editors of THE LANCET.

SIRS,—A letter in THE LANCET of July 20th, p. 171, under the heading "The Contamination of Post-offices," signed "P. M. O." sets out with the laudable intention of enlightening the public on the very numerous inaccuracies of certain other letters. The latter part of this letter contains some reference to a previous communication from me. "P. M. O," refers to my "allegations as to the excessive prevalence of tubercle among telegraphists" and my "attributing it to the insanitary conditions of post-office buildings." I have looked up my original letter and I find that I referred to "the high incidence of phthisis among certain classes of employés in the English Post Office," those classes being sorting clerks and telegraphists, but I made no comparison with any other class and did not use the word "excessive." The most careful scrutiny of my letter does not reveal the fact that I attributed the phthisical mortality of the Post Office to the insanitation of the buildings or to any other cause. I contented myself with a statement of the facts. The statistics which I quoted were statistics referring to the whole postal service and were obtained from the annual reports of the Postmaster-General. The method of calculation I adopted was the method employed by Dr. Mignot in calculating the mortality in the French postal service. Dr. Mignot's report runs as follows:—"During the year 1899, out of nearly 71,000 employés of different grades in the Posts and Telegraphs, 200 were certified as having died from tuberculosis, and 88 were retired on account of the same complaint, making a mortality of 28·1 per 10,000, and a loss from tuberculosis of 40 per 10,000, for it cannot reasonably be supposed that a very large number of those retired escaped death." The total loss is obtained by adding together the deaths and retirements from tuberculous disease. Retirement from the British Post Office on account of phthisis means that the patient's decease from that complaint is assured if not imminent. Applying the same method to the official statistics published by the British Post Office we get the result shown in the following table. The figures refer to the established staff only—every member of which is a selected life:—

Table showing Loss from Phthisis.

Year.	Staff.	Deaths.	Retirements.	Total.	Loss per 1000 living in the postal service.	Loss per 1000 living in the general population.
1896	62,852	86	67	153	2·4	1·3
1897	76,866	72	80	152	1·9	1·3
1898	79,121	70	87	157	1·9	1·3
1899	82,172	62	83	145	1·7	1·3

This table shows that there was a progressive increase in the number of retirements after 1895 and a corresponding decrease in the number of deaths, a fact which proves how close is the relation between the two sets of figures and fully confirms the method of computing the total loss from phthisis.

So much in substantiation of the statistics of my letter. Reference is made by "P. M. O." to other statistics "just issued" which "reveal that this disease exists only to a very limited degree amongst all grades of postal employés." If this statement be true then the Postmaster-General is wrong, for the figures I have quoted are from his annual reports. "P. M. O." must settle this with Lord Londonderry.

But the most extraordinary statement is made that these statistics have been recently collected and apparently classified. "P. M. O.," I imagine, means "Postal Medical Officer," and I also imagine that information in the possession of postal medical officers is readily accessible to the Postmaster-General. Yet on Tuesday, June 18th last, when Sir Walter Foster asked for statistics of this very nature the Postmaster-General's representative replied "that it would be difficult to give all the details referred to," &c.

That the men fall short in many respects in their private life I am ready to admit, and in this matter they share the ignorance of the great mass of the British public concerning the causation and prevention of consumption. But their sanitary standard owes nothing to the intelligence of the Post-office medical department which allows month-old, nay, year-old, dust to remain on the walls of the General Post Office itself, and has provided not a single spittoon nor a publicly exhibited prohibition against expectoration within the buildings.

I am, Sirs, yours faithfully,

CHARLES H. GARLAND.

"UNBOILED *v.* BOILED MILK."

To the Editors of THE LANCET.

SIRS,—In THE LANCET of July 20th, p. 169, Dr. Robert Hutchison, by producing a large amount of experimental evidence, has completely refuted Dr. Dukes's main contention "that the nutritive value of milk is very largely diminished by boiling." In THE LANCET of August 20th, 1892, p. 434, are quoted some experiments of Dr. Chamouin of Paris which support Dr. Hutchison's views. Kittens fed on boiled milk were twice as fat and healthy as those fed on raw milk. Dr. Chamouin also investigated the infantile mortality of Paris and came to the conclusion that "thousands of infants are annually safeguarded from intestinal disease and death by the precaution of boiling the milk on which they feed." It appears to me that Dr. Dukes magnifies the dangers arising from boiled or sterilised milk and minimises those from unboiled milk. One can only form an opinion from one's own experience and mine is decidedly

ifferent from Dr. Dukes's. During the last 12 years, here and elsewhere, I have met with six milk-borne epidemics, four of scarlet fever, and one each of diphtheria and enteric fever. In these epidemics the value of sterilising milk was repeatedly proved.

My experience of milk-borne epidemics may have been unusually large, but the frequency of their occurrence is well shown by reference to the late Mr. Ernest Hart's papers on this subject. Dr. Dukes says that "the destruction of the nutritive qualities of milk (by boiling) means for artificially reared infants rickets, infantile scurvy, and tuberculous diseases." No doubt rickets and infantile scurvy are prone to occur amongst children brought up by hand, but are not these diseases more often due to the milk being deprived of its fat by skimming and to the addition of artificial foods? It is impossible to believe that sterilising milk produces tuberculosis; surely it is the best method of preventing it.

Everyone will agree with Dr. Dukes that much greater care should be taken to insure the purity of our milk-supply. To do this the public must be educated up to the importance of pure milk and sanitary authorities and medical officers of health must be more alert to the frequency of milk-borne epidemics. The regulations and requirements of the Aylesbury Dairy Company, as mentioned in THE LANCET of June 29th, and the reported intention of the borough council of Camberwell to prosecute the sellers of tuberculous milk are steps in the right direction, but until milk-supplies are much more carefully inspected and regulated I feel sure that it will be much the safest plan to boil or sterilise all our milk. I am, Sirs, yours faithfully,

Bedford, July 20th, 1901. W. GIFFORD NASH.

To the Editors of THE LANCET.

SIRS,—It is greatly to be hoped that Dr. Robert Hutchison's convincing letter, published in THE LANCET of July 20th, p. 169, will induce those who contend that boiling milk appreciably impairs its nutritive value seriously to reconsider their position. I have looked in vain for any logical evidence in support of their contention. The physician above all others must not allow himself to be carried away by mere impressions; he must subject his views to a searching investigation before giving them to the world as facts. All the more needful is this when the question at issue is one of national concern.

The effect of controversy is but too often to leave the audience in doubt as to which side is in the right, one of the reasons of this being that most men, unconsciously it may be, seek to establish the truth of their own views rather than the truth itself. Now, Sirs, in regard to the question of boiled *versus* unboiled milk, we cannot afford to be under any misapprehension as to the truth or we shall stand stultified before the world. On such an elementary point in dietetics we simply must not be divided. Our plain duty is to cast aside vague impressions and to be guided by the logic of evidence alone, and all the reliable evidence before us goes to show that boiling does not in any appreciable degree affect the nutrient value of milk. When, therefore, we are in the slightest doubt as to the purity of a milk-supply we need have no hesitation in advising our patients to have the milk boiled.—I am, Sirs, yours faithfully,

Wimpole-street, W., July 20th, 1901. HARRY CAMPBELL.

"A SIMPLE FORM OF PUMP FOR INFLATING THE ETHER-BAG."

To the Editors of THE LANCET.

SIRS,—On page 153 of THE LANCET of July 20th there is a letter from Mr. Herbert J. Robson with an illustration of his "simple form of pump for inflating the ether-bag instead of by breath inflation." From the context it is obvious that "inflation by breath" of the anæsthetist is meant, which, as Mr. Robson very correctly says, is "a practice by no means pleasant or advisable either for patient or medical man." I would, however, go farther than this and say with confidence that under *no circumstances whatever* is it necessary for the administrator to use any means other than the patient's breath for the inflation of the supplemental bag. Consequently all "simple forms of pump" for this purpose are entirely unnecessary. If the administrator cannot fill the bag by means of the patient's breath during expiration, it simply means that he is unable, and therefore incompetent, to use the apparatus.

I am, Sirs, yours faithfully,

EDGAR WILLETT, M.B.Oxon., F.R.C.S.Eng.,
Administrator of Anæsthetics to St. Bartholomew's Hospital.

Welbeck-street, W., July 22nd, 1901.

"BRITISH MEDICAL MEN AND GERMAN WATERING-PLACES."

To the Editors of THE LANCET.

SIRS,—There is much in the letter of Dr. Thomas Dutton in THE LANCET of July 20th, p. 171, with which the greater part of your readers will agree, but I feel compelled to take exception to the following statement: "The majority of the cases which are sent or go to Germany for Schott's treatment return without any benefit and would improve much better under ordinary treatment at home on account of the cases being unsuitable for Schott's treatment." My experience, which is probably not second to that of Dr. Dutton in this matter, has led me to form a precisely opposite opinion. It would, therefore, be interesting to know on what statistical basis or other data Dr. Dutton has been led to form the opinion which he has expressed.

I am, Sirs, yours faithfully,

July 22nd, 1901. W. BEZLY THORNE.

REPORT OF THE CONSTITUTION COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

To the Editors of THE LANCET.

SIRS,—The committee appointed at the annual meeting of the British Medical Association last year at Ipswich for the revision of the constitution of the Association are to be congratulated upon their valuable report, published in last week's issue of the *British Medical Journal*, and which is to be submitted to the annual meeting at Cheltenham on Tuesday, July 30th. An animated discussion may probably be anticipated upon several points; two of these especially occupy a commanding position, and they are (1) the proposal regarding delegates or representatives of divisions, and (2) the payment of the travelling expenses of the members of the Council of the Association and of the various committees, &c.

1. The clauses—16 and 19—relating to the election of delegates by the divisions will no doubt meet with considerable opposition. To my mind a body of delegates savours strongly of trade unionism; it is foreign to other scientific and professional societies, and is unusual even in other such societies registered under the Companies' Act; it implies distrust of the central council of the Association, and would tend to weaken alike their sense of dignity and responsibility. It would, moreover, be very expensive and, in my view, quite unnecessary, because its object, that of "securing to the general body of members of the Association the most complete control possible over its policy and government," can be gained easily and effectively by extending to them in the general meetings and under proper conditions the power of the referendum so properly proposed to be conferred upon the central counci' in Clause 19.

2. The proposed payment of travelling expenses to all members of the central council, committees, &c. (Clauses 16 and 21), is also likely to encounter a large volume of disapproval. For my own part I regard this as a mercenary proposal, as one offensive and derogatory to those high-minded members whose sole or chief object in accepting any office would be the interests and honour of the Association and of the profession at large, and I think it would be calculated to give fresh occasion to those unfriendly critics—some in very high places—who are prone to scoff at "a breach of some rule of the medical trade union."

I am, Sirs, yours faithfully,

JOHN INCE, M.D. St. And., I.M.S. (retired).

Swanley, July 22nd, 1901.

To the Editors of THE LANCET.

SIRS,—I shall esteem it a favour if you will allow me to intimate to your readers that there will be a meeting of some

members of the British Medical Association on Monday evening, July 29th, 1901, at 9 o'clock, at St. Mary's Hall, Cheltenham, to consider what attitude to adopt towards the report of the Reconstitution Committee, notably regarding finance and the suggestion to have two or more ultimate authorities.

I am, Sirs, yours faithfully,

Old Trafford, July 23rd, 1901. JAMES BRASSEY BRIERLEY.

"THE TIMES ARE TROUBLOUS": AN ANALYSIS BY A GENERAL PRACTITIONER.

To the Editors of THE LANCET.

SIRS,—It is not to be denied that "the times are troublous" for the general body of the medical profession. Work never was so scarce and never were there so many to do it. The first of these axioms—for axioms they have unfortunately become—depends on two causes, the existence of both being amply proved by the last census report—a diminishing birth-rate and a decreasing death-rate. For the former we, as a profession, are in no way to blame. It may be merely that in this age of extravagance and luxury men with moderate incomes avoid matrimony on account of the responsibilities it brings: it may be that, being married, the natural results of matrimony—a family—are artificially evaded. Whatever the reason the fact remains, and while it is to be deplored as a national misfortune by all who believe in the doctrine of John Stuart Mill that population means prosperity, it tells hardly on the general practitioner who relies so much on midwifery and infantile ailments for his daily bread. The second cause is one we can and do unselfishly rejoice in, because all of us have had our share in bringing it about. Death bears a certain proportion to illness, probably a fairly fixed proportion. So a decreased death-rate indicates a smaller amount of illness and of course fewer fees. But regardless of this consequence, mindful only of their duty as the guardians of public health, the profession have insisted that the laws relating thereto should be searchingly applied in their own localities and the houses of their patients. It is chiefly owing to this that illness has diminished and death decreased. With these two causes lightening our pockets slowly but certainly, the number in our ranks was never greater. (I believe this to be so, notwithstanding the present scarcity of locum-tenents and assistants.) What wonder, then, that the struggle for existence among us becomes keener and keener, the necessity for self-advertisement more strongly evident and harder to resist, the regard for the rules of etiquette less and less marked, till many even emulate the butcher and baker and leave their card at the door of every fresh-comer? Legitimate competition is healthy, even desirable. But until the day when civil practice is a Government service paid out of the rates, we are, I fear, bound to struggle excessively among ourselves. Birth and death will continue to diminish and though I see signs that our numbers will not much further increase, the supply is likely to continue greater than the demand.

"The times are troublous." So far I have dealt with causes which we cannot help, do not wish to help, or which we hope time may modify by natural means. But are there no others? No doubt there are, many more. And surely if we find some of the work legitimately belonging to us, who need it so much, removed from our grasp it is our duty to ourselves to act together and to bring it back. Now it seems to me that in two ways are the profession deprived of fees which legitimately belong to them. One is the out-patient department of hospitals, the other the prescribing chemist. No one can deny that the out-patient department of hospitals is enormously abused. Take the thousands of cases treated there annually, and of that number what percentage are proper cases, either as regards the means of the patients or the out-of-the-way character of the malady for which they seek treatment? I should be sorry to exaggerate, but I doubt 10 per cent. and, if my estimate is correct, 90 per cent. of these thousands are depriving some medical man of work legitimately his. I recognise the necessity of out-patients in the teaching schools, but I do maintain that such a vast number cannot be properly attended to, that the slight ailments of many make them ridiculous as hospital cases, and that the great majority would be better looked after if they consulted a medical man in their own neighbourhood, while they are perfectly well able to pay the moderate fees he would charge them. Out-patient rooms have become a huge abuse by steps so gradual that it is difficult to say when the good was overbalanced by the evil. Now what is the remedy for such abuse? No one would wish them done away with, but I would suggest that no patients should be seen there, except casualties, without a hospital letter and that such letter should in addition to the signature of the subscriber be of necessity signed by a medical man of the district in which they live. Soon, very soon, would the number be thinned, and as a consequence the department as a teaching centre would be far more valuable, the cases attending would be suitable in every respect, the work would be thoroughly done, because there would be time to do it, the public would benefit rather than suffer, and the profession would be enriched in a very appreciable degree.

For the prescribing chemist we are to a large extent responsible. We gave him birth, we have nurtured him carefully, and now he is grown and strong he smites us in the back. Those of us who can still boast our youth, and those who live in towns, suburbs, and villages of decent size, have been taught to believe that to dispense drugs is a separate business, excellent in itself, useful to our fellow-men, but on the whole derogatory to us as a profession. So, instead of seeing our patients and making their medicine in our own surgeries we see them and write prescriptions, or order their medicine at our chemist's. The result is that chemists have learnt to prescribe just as a parrot learns to repeat. Forgetful of the fact that to us they owe much business they do and the position they occupy and through us the parrot-like knowledge which they have gained, grossly unmindful also of the illegality of their action, they prescribe for colds, coughs, sore-throats, and almost any ailment with unblushing effrontery, never minding whether it is minor or not, so long as they sell their physic at a better price than they would get from the medical man. So common is it for the public to seek Mr. Chemist's advice, that from many he receives with as much naturalness as if it were his due the title of "Doctor." It may be said that this cuts both ways, that these tradesmen's prescriptions are likely to do more harm than good and the medical man in the end obtain a longer and more serious case. Theoretically this may be so, but in practice, no. I believe this prescribing by chemists is a serious and rapidly-growing abuse. Surely something can be done—surely something without the necessity of going back to old ways and making up physic ourselves. I ask our General Medical Council to put themselves into communication with the Pharmaceutical Society and to make some severe examples. They will be easy to find, for the practice is universal. It is illegal, it is a public matter—surely it should not be left to individuals to bear the expense and the burden of punishing these flagrant wrong-doers. I hope, Sirs, these words of mine may bear fruit. I have said enough, at any rate, to open the subject and I am convinced that if these two abuses were revised and corrected none would suffer unjustly, while the profession would legitimately benefit to an extent that for fear of exaggeration I am afraid to put into figures.

I am, Sirs, yours faithfully,

July 1st, 1901. G.P.

THE ETHICS OF ELECTIONS.

To the Editors of THE LANCET.

SIRS,—The recent election at the Cardiff Infirmary opens up some rather interesting points—and points which seem worthy of discussion. There is no necessity for any personal references in the discussion of such points. A, B, and C are candidates (with others) for an appointment. The voting is by ballot and the voting in the first round is as follows: A, 48; B, 42; C, 42. In the second round the voting is as below: A, 50; B, 42; C, 42.[1] The chairman of the meeting declares that there are two courses open—viz., either he is to decide which of the two candidates who tied should retire or the meeting should be asked to vote on the subject. As the meeting decided in favour of the latter course a ballot was taken and the voting was as follows: B, 65; C, 64. But in this round there were four spoiled papers, three being unmarked and one with a mark for A, who it will be noted was not in this round at all. C having received one vote less than B is knocked out and the final round is A, 84; B, 45. There were two spoiled papers in this round.

Now the point of interest in the case is this: whether the

[1] The increase in A's votes is accounted for by the fact that another voter had arrived and by the transfer of a vote from one of the other outside candidates.

mode adopted for deciding which of the candidates (B and C) should retire is really a fair one. It must be admitted that it was the quickest way of determining the point, but looking at the facts of the situation—viz., that it was well known that the two strongest candidates were A and C and that the supporters of A could easily arrange for some either not to vote at all (as evidently was the case from the fact that there were three papers *unmarked*) or else vote for B, the weaker of the two candidates, it is apparent that although the quickest it was not the *fairest* way of arriving at a decision. It is not probable that there are many examples of such a state of things, but if any of your readers can call to mind any similar ones it would be interesting to know what course was adopted. It would naturally have been a trying process to continue voting for the three candidates until the tie between the second and third ceased to exist. At the same time the interests of the three candidates demanded that some such process should have been adopted. I am, Sirs, yours faithfully,

July, 1901. A GOVERNOR.

THE DEFICIENCY OF CANDIDATES FOR THE MEDICAL SERVICES.

To the Editors of THE LANCET.

SIRS,—Amongst the various reasons accounting for the small number of candidates for the services I consider the conditions of entrance to be one of the chief causes. A candidate can go up for his entrance examination between 21 and 28 years of age, but he must be under 25 years if he wants to obtain the chief advantages of the service and to run to the higher pensions; otherwise he comes under the "age clause" and the highest pension he can obtain is that of 25 years' service. Now, on looking through the newly qualified men of any school, many, if not most, of the best men—i.e., men who have qualified well and done a year or so in the house—are 25 years of age or thereabouts, and to these men the services are practically closed, as they cannot hope to run beyond a 25 years' pension. The consequence of this is that men intending to go into the services cram through the first double that they can get, their chief object being to enter early.

If this forced retirement at 55 years of age was done away with not only would a much larger field to recruit from be open, but a better class of man would come up, and also the man who now craves to get in early at any price might be tempted to be in less of a hurry and to do a year or so in the house before entering the service. The value of going into the house (either a house surgeoncy or a house physiciancy) is well recognised in civil life as being the best thing a man can do, but for a man going into one of the services it is the worst thing possible, as he loses seriously and may run over 25 years of age. If the abolition of the "age clause" was made retrospective and every man could complete his 30 years' service, the present want of men would to a large extent be reduced, as yearly many of our best men—anyway in the Indian Medical Service—are retiring at about 50 years of age who would gladly serve on could they run for a higher pension. If the "age clause" cannot be done away with as a whole could not men who have come in late due to passing some of the higher examinations or having done a house surgeoncy, &c., be exempted and be allowed to complete their 30 years and thereby obtain a better pension? Again, should a man enter late and during the time he is in the service he passes, say, his Fellowship (F.R.C.S. Eng.), could he not be exempted? If there were some conditions of this kind it would not only tempt better men, but might tend to keep many men already in the services in better touch with their profession. I am, Sirs, yours faithfully,

July 4th, 1901 I.M.S.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

Increase in the Plague Epidemic.—The Invasion of Locusts.—The Increasing Famine and the Deficient Monsoon.—The Extinction of the Andaman Islanders.—The Crime of Poisoning in India.—The High Infantile Mortality in Bombay City.

THERE has been an increase of 138 deaths from plague throughout India during the past week. The deaths returned are 821 as against 683 for the week ending June 22nd. The development has occurred in the Bombay Presidency which records 651 deaths as against 471. There has been an increase of 17 in Bombay city, 12 in Bengal, and 20 in Mysore. Calcutta returns only 14 deaths and there are decreases in the North-west Provinces, the Punjab, Oudh, and Kashmir. Belgaum, on the borders of the Bombay Presidency, shows a distinct rise—viz., from 207 deaths to 276.

Locusts have appeared in several districts of India during the past week and have done an immense amount of damage. Indigo and other crops have been seriously affected and Makai and Cheena have been eaten up completely in places. Some of the flights are exceedingly dense and very large. The Government has warned district officers that the villagers should be organised to commence a campaign against young locusts as soon as they appear above the ground. The Cyprus screen and trap system has proved useless both in the Deccan and Konkan. Dr. Edington's method of inoculating with fungus is advised. One flight attacked an indigo ground four times on consecutive days, and in South Tirhut a flight was estimated at 14 miles broad and to have covered an area of 140 square miles. The country was red for miles—the indigo crop looking a browny red, having the appearance of being covered with red chillies. The swarms are evidently in search of a favourable breeding-ground. It takes the young locust 10 days after hatching before it can use its wings, and when in this stage it crawls about and eats up almost everything. Then is the time for its destruction.

Still another misfortune for India consists in the increasing famine. There are now over half a million persons in receipt of relief and the numbers rise higher week by week. The cost to the Government is 150 lakhs per month. The late monsoon and its great deficiency, except in the Peninsula, are a cause of still further anxiety.

The extinction of the natives in the Andaman Islands would seem to be only a work of time. The recent census tells the old story. Measles, pneumonia, and other introduced and contagious diseases have played their part, and as in the case of all diseases which find a susceptible race the percentage of mortality has been terrible. One tribe is said to have killed off every individual who was attacked by a contagious disease which had been introduced among them by a neighbouring coast tribe. Sterility seems also to have checked the population as the number of children is abnormally small. At the present rate of decrease some tribes will be extinct after three generations.

The record of a year's poisoning in the Bombay Presidency shows how extensive this practice is. Arsenic is the favourite agent, probably owing to the facility with which it can be procured and the rough similarity of the symptoms produced by it to those of disease. Major Barry records one case where two beggars were drugged with opium in order that they might be robbed of eight annas (8*d.*). The medico-legal cases referred to in the report only show the cases which are brought to light, but it is a common opinion that the crime of poisoning is excessively frequent. These remarks apply to nearly all parts of India. Copper, cerbera, dhatura, mercury, phosphorus, and ground glass are other poisons selected.

The high infant mortality in Bombay has been the subject of much recent discussion. From the census of 1891 the infant population (that is of children under one year of age) is estimated at 25,000. Before the advent of plague the birth-rate of Bombay city was fairly steady at about 18 or 19 per 1000 of the population, giving a total of about 15,000 to 16,000 births annually, and there was an average rate of mortality of about 280 per 1000 of the infant population (about 7000 annual deaths). Since the year 1897 the birth-rate has declined to the rate of 12 or 13 per 1000, but the mortality has gone up enormously. In 1899 the rate rose to 530 per 1000. This is a frightful figure. The explanation given is that the disastrous famines cause a large inflow into the city of people in a low state of vitality. The sterilising influence of plague, as well as the exodus of people and the diminished population, may account for the diminished birth-rate, but the above reason hardly seems sufficient to account for the enormous difference in the death-rate. The health of Bombay has been in a bad state for some time quite apart from plague, but though the general mortality has been excessive it will not explain the doubling of the infant mortality. At the present time the general death-rate in Bombay is about 42 per 1000 per annum as compared with the rate of 64 for the corresponding period last year, so that the high infant mortality, coupled with a diminished birth-rate, requires further investigation.

July 6th.

THE BRITISH CONGRESS ON TUBERCULOSIS.

INAUGURATION OF THE CONGRESS: FIRST GENERAL MEETING.

THE British Congress on Tuberculosis was opened by H.R.H. the Duke of Cambridge, acting on behalf of His Majesty the King, on the afternoon of Monday, July 22nd. The inauguration ceremony was held at St. James's Hall, Piccadilly, W. The meeting was successful in regard to general attendance, while the cordiality of the welcome extended to the foreign delegates was unmistakeable.

The platform was crowded with well-known public men. Among those present may be mentioned most of the foreign Ambassadors, the Duke of Northumberland, the Marquis of Lansdowne, the Marquis of Bath, Earl Cadogan, the Earl of Derby, Earl Spencer, the Earl of Cawdor, Lord Lister, Lord Strathcona, the Bishop of London, the Lord Mayor of London, the Consul-Generals of the various colonies, and the Presidents of the great medical corporations and learned societies of the United Kingdom. The numerous official delegates to the Congress of the various foreign nations were all accommodated with prominent places on the platform.

Mr. MALCOLM MORRIS, at the request of the Duke of Cambridge, commenced the proceedings by reading his report as honorary secretary-general to the Congress. The movement, he said, originated in Berlin at the German Congress on Tuberculosis held in May, 1899, when representations were made to the British delegates as to the desirability of holding a similar congress in London. Some of these delegates were appointed by the Prince of Wales to represent the National Association for the Prevention of Consumption and Other Forms of Tuberculosis, and these reported the matter to the Council of that association. One of the objects of the association was the promotion of congresses for the dissemination of knowledge, and it was therefore resolved to take the necessary initiatory steps to hold a congress in London. The Foreign Office, the Colonial Office, and the India Office rendered every possible assistance. In Paris and in Berlin local committees had been formed to distribute information as to the objects of the Congress. At the request of the King the Duke of Cambridge had undertaken to fill the office of President of the Congress and to preside at that meeting.

The Duke of CAMBRIDGE, in rising to declare the Congress open, said that he hoped he would be forgiven by the assembly for undertaking a duty which he really felt unable to fulfil. The fact was that he was very much in the background with regard to all the interesting subjects of the Congress that had brought them together, but he felt a deep interest in them notwithstanding. He was gratified to see so large a number of delegates from foreign countries, and he appreciated the compliment that they paid to this country in attending. The Duke concluded by reading out to the meeting the following telegram which he sent to the King: "I have the honour to inform your Majesty that I have opened the Congress on Tuberculosis, which is largely attended by home and foreign delegates, in obedience to your Majesty's commands."

Lord LANSDOWNE then addressed the meeting and as one of His Majesty's servants welcomed the foreign delegates, saying on behalf of his colleagues in power that it would afford them the greatest pleasure, so far as their opportunities permitted, to give any facilities which His Majesty's Government was able to afford. The Government fully realised the immense significance of the problem which the Congress was attempting to solve.

Lord CADOGAN then spoke and claimed a *locus standi*, inasmuch as he represented Ireland, which country suffered perhaps as severely as any in Europe from the scourge they were met to consider and if possible to arrest. He was glad on behalf of the people of Ireland to add a few words of welcome to the Congress and especially to the foreign members who were to give them the benefit of their assistance on the occasion. It was generally known that the methods of dealing with tuberculosis in past years had not been successful, but it had of late been shown that methods would before long be found for dealing practically with its prevention.

The LORD MAYOR OF LONDON in a short speech welcomed the foreign delegates and the members of the Congress to the City of London and hoped that they would all come to the Mansion House on the following evening. The citizens of London, he said, regarded the objects of the Congress as second to none that could possibly be conceived in importance.

Lord STRATHCONA, who spoke for the Dominion of Canada, for the commonwealth of Australia, and for the colonies generally, said they were all united in an earnest desire that measures should be taken to grapple with a disease which had decimated the peoples of the world for centuries.

Lord LISTER pointed out that the Congress met under immeasurably happier auspices than could possibly have been the case a few years ago. They now knew, thanks to Koch, the enemy they had to deal with, while Pasteur had shown that the microbe of tuberculosis was incapable of originating *de novo* in the human body. Hence there was now the splendid prospect of the prevention of tuberculosis. Attempts were being made by the use of various specific means to deal with consumption even in its more advanced forms, and some of them at least had very promising aspects. If the prevention of tuberculosis was to be effectively carried out, the general public must aid the physician and the surgeon in their endeavours to immunise the people and so eventually to stamp out one of the greatest physical scourges of the human race.

The foreign delegates were then presented to the Duke of Cambridge by Lord Derby, and they addressed the meeting briefly.

Professor OSLER (America) thought that the Congress would educate the medical profession which needed education and the public which needed it far more.

Professor VON SCHROETTER (Austria) believed that the Congress would inaugurate a new and successful attack against man's greatest enemy.

Dr. MONTEFIORE LEVI (Belgium) attributed a large share in the success that had been attained to the active interest taken in the work by the Royal patron of the Congress.

Professor GRAM (Denmark) referred to the English people having taken the rose of Denmark for their Queen.

Professor BROUARDEL (France) said that the union of science and philanthropy marked a new phase in the contest against tuberculosis. He had been specially charged by the President of the French Republic to declare in his name that it was his earnest wish that the next Congress should be held in Paris in two years' time.

Professor VON LEYDEN (Germany) referred to the early work done by England in the prevention of tuberculosis.

Professor RUATA (Italy), after a graceful acknowledgment of George Boddington's labours, concluded by expressing the thanks of Italy to England for what she had done for the whole world.

Mr. MALCOLM MORRIS then read a telegram from the King acknowledging the telegram from the Duke of Cambridge and heartily welcoming to his capital the eminent men belonging to almost every nation.

The proceedings came to a close with a hearty vote of thanks to the Duke of Cambridge for presiding, which was moved by Lord DERBY and seconded by Sir WILLIAM BROADBENT.

THE SECOND GENERAL MEETING.

Professor R. KOCH of Berlin addressed the members of the Congress assembled at the Second General Meeting in St. James's Hall, on Tuesday, July 23rd, Lord LISTER being in the chair. The title of his paper was "The Combating of Tuberculosis in the Light of the Experience that has been Gained in the Successful Combating of other Infectious Diseases." The address will be found in full at page 187.

The views expressed by Professor Koch in regard to the passing of tuberculosis from man to animals evidently attracted extraordinary attention and Lord LISTER'S speech as chairman was followed by the huge assembly with extreme interest, each point made by him being made the occasion for a burst of applause. The matter at issue, he said, was of great importance. If Professor Koch was right then preventive measures would be much simplified, but before the Congress could give its consent to the hypothesis the most complete investigations must be undertaken. Lord Lister before he resumed his seat instanced the infection of the mesenteric glands from bovine tuberculosis in support of his contention that the evidence advanced by Professor Koch was not conclusive.

Professor NOCARD (Alfort) spoke as a member of the veterinary profession in France and described how the exaggerated fears of tuberculous infection from animals had raised a movement which they had only just begun to encounter with success, and now it would appear as if the swing of the pendulum might take them dangerously far in quite the opposite direction. Professor Nocard discussed the subject of the possibility of infection of man by bovine tuberculosis and cited cases where veterinary surgeons had become thus inoculated by accident.

Professor BANG (Copenhagen) in a few words warned those present that though Professor Koch had shown that there was only slight danger of infecting animals from man, nevertheless the inoculation of man from animals was a different matter, and in his opinion Professor Koch went too far in saying that there was no necessity for taking measures against bovine tuberculosis.

The meeting ended by Professor SIMS WOODHEAD pouring oil on the troubled waters. He did not consider that Professor Koch's views were so violently opposed as they appeared to be to modern pathology. In the course of his remarks he described a specimen exhibited in the museum of the Congress which proved that it was possible for human beings to be infected with tuberculous disease from animals.

THE THIRD GENERAL MEETING.

The Right Honourable HENRY CHAPLIN, late President of the Local Government Board and of the Board of Agriculture, presided over the third general meeting of the Congress on Wednesday afternoon in St. James's Hall.

Mr. CHAPLIN, in introducing Professor Brouardel to the meeting as the President of the Paris Society of Medicine, said that as the leading medical adviser to the French Government he might be considered to rank among the highest living sanitary authorities. He remarked that hitherto the opposite of Professor Koch's views had been the accepted doctrine—viz., that bovine tuberculosis is transmissible to man through the flesh and milk of cattle. Professor Brouardel then delivered his address which will be found in full at page 191 of THE LANCET.

THE SECTIONS.

THE work of the various sections commenced on Tuesday, July 23rd, at 9.30 A.M.

SECTION I.

STATE AND MUNICIPAL.

TUESDAY, JULY 23RD.

The meetings of this section, in many ways the most important section of the Congress because of the vast public interests involved in the discussions, were held in St. George's Hall, Langham-place, W.

The proceedings were opened at 9.30 A.M. on July 23rd by the Right Honourable Sir HERBERT MAXWELL, Bart, P.C., M.P., F.R.S., with a short address. He said:—

No one in this room could feel more his own unfitness for discussing the matters which are to be brought under the consideration of this Congress than I, being myself wholly without previous special training. I trust, therefore, you will regard me only as a link, however weak, between scientific research and the legislative machine which it is the fashion of men of science to set in motion. We sometimes hear complaints, especially in this country, that the legislator does not keep abreast with the advance of science. I would remind you that men of science must be in a great measure pioneers. Pioneers have to retrace their steps sometimes. That is why we appear to be laggard in the advance. However unfit I am to discuss the subjects proper to the Congress there is one thing which at all events I may venture to say, and that is to bid a hearty welcome to those ladies and gentlemen who have travelled, many of them from far foreign countries, to take part in the business of the Congress. In one respect I am afraid our welcome to our foreign guests must partake of the nature of an apology. Those who were present at the great Congress in Berlin in 1899 must cherish a warm recollection of their reception there; the princely hospitality displayed to them, the liberal manner in which the great building of the Reichstag was placed at their disposal for the transaction of the business, and, above all, the warm personal interest displayed by the German Emperor, his Empress, and the Ministers of State. The circumstances of mourning under which this country lies at present owing to the death of our good Queen have rendered it impossible for King Edward VII. and his Government to impart to your reception in this country and in this metropolis that degree of warmth which, under other conditions, would have been most natural and fitting. I pray you, therefore, gentlemen from foreign countries, to bear this in mind and to make allowances for any shortcomings in your reception here on the present occasion.

I have spoken of you as foreigners, but I do not forget that in science and philanthropy there are no physical frontiers separating nation from nation. We work hand-in-hand in the common cause without jealousy, though emulating one another in the search for truth, and looking for no reward save in the common welfare of the community. It is not unfit perhaps on the threshold of your labours that I should remind you of the vast advance that has been made in the past, and of the presence of Professor Koch among us who was the first to specify the bacillus of the disease under consideration. Rapid progress as we have made, far more lies before us. If I venture to touch upon two points which will come under your notice it is not because I assign to them a higher importance than the other matters which will be considered, but it is because as an unprofessional man certain points must present themselves to me with greater distinctness than others. There is the great question of the notification of consumption on the paper for discussion to-day. Upon that point I would ask you to bear in mind how impossible it is to induce an uneducated and self-governing community to adopt restrictions and precautions unless and until they comprehend the nature of these precautions and share in the understanding that they will be effective. Our experience in this country in the matter of compulsory vaccination will I am sure make the legislators extremely shy of making any step in the direction of control of tuberculosis unless they feel that they have the weight of public opinion behind them. I need not labour that point. As far as Great Britain is concerned let the people in this country thoroughly grasp the facts (1) that the returns show that the mortality from tuberculosis has been diminished from 38 per 1000 in 1832 to, I think, 14 per 1000 of the population in 1894, and (2) that tuberculosis still remains answerable for a greater share of the mortality in this country than all the other most dreaded infectious diseases put together—let them once thoroughly comprehend that much and, speaking from a considerable knowledge of my own countrymen, I venture to say that no insuperable difficulty will be found in the way of general notification. My other point is a minor one. It is in connexion with the subject of the influence of housing and aggregation of population. There is a thing which is apt to be overlooked. Our Scripture says: "Dust thou art and unto dust shalt thou return," and in our praiseworthy efforts to delay that return as long as possible we have come inevitably to the conclusion that there is no more potent agency in the dissemination of disease than dust itself, and no such potent agency in the sterilisation of that dust as abundant sunlight. What I wish to bring out is this, that while we have spent large sums of money in bettering the houses of the working classes we are face to face with a new danger. In our great commercial centres, where land is measured and valued at so many guineas to the square foot, the tendency must be to pile up houses higher and higher and so to exclude that priceless agent the sunlight. I think it is worth the attention of municipalities and other governing bodies to deliberate whether some restriction should not be imposed upon architects and builders so that the height of the houses should be on a definite proportion to the width of the streets. I anticipate most valuable and practical results from the conclusions to which you will come. You have to consider and advise what part the State and municipality are to bear in putting into practical effect the discoveries of science.

The work of the section was arranged under five divisions—viz. (1) Statistical; (2) Notification of Tuberculosis; (3) Influence of Housing and Aggregation; (4) International Aspects on Tuberculosis; and (5) Provision of Sanatoria.

DIVISION I., STATISTICAL.

Dr. JOHN TATHAM of the General Register Office, Somerset House, opened the business of this section by communicating a

Memorandum on Mortality from Tuberculous Phthisis in England and Wales during the last 40 years.

The mortality from phthisis at all ages in the four years, from 1896 to 1899, he said, was equal to a rate of 1521 per

1,000,000 living among males, and to a rate of 1141 per 1,000,000 among females. Among male children under five years old the rate was 403 per 1,000,000, and among female children it was 334. Male children aged from five to 10 years died at the rate of 140 per 1,000,000, and female children of the same age at the rate of 201 per 1,000,000. At the ages from 10 to 15 years the male rate was 195 and the female rate 410 per 1,000,000. In both sexes the real liability to phthisis began somewhere between the fifteenth and the twentieth year. Among males the death-rate at the age-group from 15 to 20 years stood at 908 per 1,000,000, and attained its maximum at the age-group from 45 to 55 years, when it reached 3173. Among females at the age-group from 15 to 20 years the rate was 1165, and attained its maximum (2096) at the age-group from 35 to 45 years. In both sexes the rate rapidly declined after the attainment of its maximum. Practically the incidence of phthisis was upon the ages from 15 to 75 years, very old people and young children being comparatively exempt. According to recent experience females seemed to be rather *less liable* than males to death from phthisis at ages under five years, *more liable* at the age from five to 20 years, and again *less liable* at subsequent ages. Liability to fatal phthisis appeared to commence somewhat earlier in females than in males.

in 1851–60 had been 763 per 1,000,000, had been reduced to 195, and the female rate, which had been 1293, had been reduced to 410. From 15 years upwards the female rate had fallen more than had the male rate. From 25 years to the end of life the male rate had fallen in varying proportions. The fall in the female rate at the successive age-groups after 25 years had not differed greatly from one-half. Tracing backwards the incidence of maximum mortality from phthisis it was found that it had not always been at ages from 45 to 55 years for males and from 35 to 45 years for females as it was at present. In the decade 1851–60 the mortality from phthisis was at its highest among males at ages from 20 to 25 years and among females at ages from 25 to 35 years. Thus the age of maximum phthisis mortality had been postponed in both sexes. In other words, either the saving of life had been greater at the ages which were formerly most liable to phthisis than at the ages immediately following, or persons specially liable to phthisis had lived longer than they would have done under the earlier conditions.

Dr. Tatham also submitted two other tables. One of these (Table B) compared the mortality from phthisis in 1881–90 with that in 1895–99 in each of the registration counties of England and Wales, showing the proportional decrease in the phthisis-rate of each county in the later four-year period as compared with the earlier decennium.

TABLE A.—ENGLAND AND WALES.—TUBERCULOUS PHTHISIS.—MORTALITY IN SEVERAL PERIODS FROM 1851 TO 1899. ANNUAL RATE PER 1,000,000 LIVING.

MALES.

Period.	Ages.											
	All ages.	Under 5 years.	5—	10—	15—	20—	25—	35—	45—	55—	65—	75—
1851–60	2579	1329	525	763	2389	4052	4031	4004	3830	3331	2389	928
1861–70	2467	990	431	605	2190	3883	4094	4166	3861	3297	2024	659
1871–80	2209	783	340	481	1675	3092	3699	4120	3860	3195	1924	603
1881–85	1927	564	274	372	1381	2467	3246	3726	3567	2937	1800	645
1886–90	1781	521	234	318	1212	2222	2842	3436	3446	2904	1845	733
1891–95	1634	467	197	260	1075	2026	2548	3268	3205	2686	1572	563
1896–99	1521	403	140	195	908	1841	2341	3110	3173	2627	1530	549

FEMALES.

Period.	Ages.											
	All ages.	Under 5 years.	5—	10—	15—	20—	25—	35—	45—	55—	65—	75—
1851–60	2774	1281	620	1293	3516	4288	4575	4178	3121	2383	1635	716
1861–70	2483	947	477	1045	3112	3967	4378	3900	2850	2065	1229	447
1871–80	2028	750	375	846	2397	3140	3543	3401	2464	1777	1093	407
1881–85	1738	553	350	749	2006	2596	3070	2927	2197	1541	995	372
1886–90	1497	483	307	658	1626	2075	2562	2563	1936	1460	966	423
1891–95	1303	421	260	561	1438	1740	2155	2305	1742	1294	800	350
1896–99	1141	334	201	410	1165	1547	1862	2096	1597	1242	787	368

Changes in Mortality from 1851 to 1899.—Table A indicated that, with a few trifling exceptions, every age-group in both sexes had experienced *a decrease* in the mortality ascribed to phthisis. In every case the mortality in 1895–99 was lower than it had been in 1851–60; but the rate of decrease had varier widely and had been much greater among females than among males. The reduction indicated by the table might not be wholly real and might be due, in part, to the vaguer statement of causes of death in the earlier period, as, for instance, by the habitual use of the terms "consumption" and "decline" to describe any lingering disease of the lungs attended by "wasting." The figures must therefore be taken for what they were worth. Comparing 1896–99 with 1851–60 it was found that mortality from phthisis in males *at all ages* had been reduced from 2579 to 1521 per 1,000,000, and in females from 2774 to 1141 per 1,000,000. At ages under five years the mortality of males had been reduced from 1329 in the earlier period to 403 in the later and that of females from 1281 to 334. At the age-group from five to 10 years the rate had fallen from 525 to 140 among males and from 620 to 201 among females. At the age-group from 10 to 15 years the male rate, which

The other showed that the mortality from phthisis was also very seriously affected by occupation. Thus among people presumably not widely different in respect of social position—such as tin miners and coal miners—a number of males living at ages from 25 to 65 years, which gave 508 deaths from phthisis among tin miners, gave only 69 deaths (or only one-seventh part) among coal miners.

Dr. JOSEPH VON KÖRÖSY (Budapest) read a paper on

Some Observations on the Influence of Social Standing, Food and Paternal Age on the Occurrence of Phthisis,

of which the following in an abstract. He said:

"1. *Occupation.*—During the period 1874–90 I observed the connexion between occupation and causes of death of 57,910 males and 49,034 females who died at ages above 15 years. According to these observations we may state that consumption caused death most frequently amongst printers, among whom in this period of 17 years 60·6 per cent. died from consumption; thus it may be considered as an exception if any printer died from another cause of death than phthisis. The next most fatal groups, with a mortality

of nearly 50 per cent, consist of butlers, 52 per cent., shoemakers, dyers, and millers, 49·4, 49·3, and 49·2 per cent.; joiners, tinkers, and locksmiths, 48·5 and 48·4 per cent.; masons, 46·7 per cent.; working men, 43·3 per cent.; tailors, 41·8 per cent.; bakers, 39·8 per cent.; journeymen, 39·8 per cent.; drivers, 37 per cent.; servants, 36 per cent.; carpenters, 33·9 per cent.; officials, 33·6 per cent.; butchers, 33·3 per cent.; merchants, 28·3 per cent.; innkeepers, 27·2 per cent.; and lawyers, 20·5 per cent. Consumption appeared most rarely amongst capitalists, 10·6 per cent. of the deceased, and amongst physicians, 11·8 per cent. Amongst females more than half (51·2 per cent.) of the deceased died from phthisis; amongst working women nearly one-third; amongst female servants, 35·3 per cent.; female day-labourers, 33·3 per cent.; washerwomen, 31·4 per cent.; but only a quarter died amongst female gardeners (26·9 per cent.), and amongst capitalists, 4·2 per cent. But in face of such observations we can hardly neglect the influence of the different distributions of age within the different occupations. We know that the appearance of consumption depends largely upon age, occurring the most frequently with and after the age of puberty, and reaching its maximum between the thirtieth and fortieth year of age. Thus it is desirable to study the appearance of this cause of death separately with the different classes of age. This I was able to do from the year 1882, but, to my regret, only for the following ages: 15–30, 30–50, and above 50 years. Amongst 100 deceased of the following occupations who died at the age of 30–50 years, the number of consumptives was: (*a*) Males—(1) physicians, 15·1; (2) lawyers, 29·4; (3) capitalists, 30·4; (4) merchants, 35·3; (5) innkeepers, 37·0; (6) officials, 37·5; (7) butchers, 41·4; (8) journeymen, 42·0; (9) drivers, 42·6; (10) workmen, 45·3, (11) bakers, 48·5; (12) butlers, 50·8; (13) carpenters, 50·9; (14) servants, 51·3; (15) tinkers and locksmiths, 53·1; (16) tailors, 53·6; (17) masons, 53·7; (18) dyers, 55·2; (19) printers, 55·9; (20) shoemakers, 56·1; (21) joiners, 57·7; and (22) millers, 59·9. (*b*) Females—(1) journeywomen, 48·0; (2) servants, 38·9; (3) capitalists, 69·3; (4) needlework women, 65·6; (5) washerwomen, and (6) gardeners, 48·1

2. *Religious profession.*—The frequency of consumption was in the average of the five years 1885–93 out of 100,000 living people: amongst Roman Catholics, 722; amongst Lutherans, 788; amongst Calvinists, 559; Protestants, 625; amongst Jews, 376.

3. *Death.*—Out of 100,000 wealthy deceased there were swept away by consumption 15,943, whilst out of 100,000 poor persons, 22,339. Thus we may say that phthisis causes amongst poor people 40 per cent. more deaths than among the wealthy.

4. *Feed of children.*—During the seven years 1882–90, observations were made with regard to bringing up of 37,313 children deceased at the age of 0–2 years. The points noted were whether the children were brought up at home or not, and whether they were nourished at the breast or bottle-fed. The results of these observations are as follows:—

—	Brought up in the family.		Out of the home.		Total.	
	Number of the deceased.	Out of these died from consumption.	Number of the deceased.	Out of these died from consumption.	Number of the deceased.	Out of these died from consumption.
Fed at breast ...	29·679	1570	1038	90	30,717	1660
Artificially ...	5·461	348	1135	185	6,596	533
Total	35·140	1918	2173	275	37,313	2193

Thus we find that amongst 100 deceased children there died from consumption: if brought up in the family, 5·4 per cent.; if out of home, 8·9 per cent.; if fed at breast, 5·4 per cent.; and if nourished artificially, 9·5 per cent. Combining the two conditions we find:—

	Nourished at breast.	Nourished artificially.
At home	5·2 per cent.	6·4 per cent.
Out of home ...	8·7 ,, ...	16·3 ,,

Thus, the cases of phthisis amongst the children brought up artificially out of home was three times greater than amongst family children nourished at the breast.

5. *Influence of paternal age.*—The following results I quote from my paper read at the London Congress of Hygiene and Demography. It refers to 10,385 children deceased at the age of 0–10 years and observed according to the age of father and mother. I found that amongst 100 deceased children the number of consumptives was, at the maternal age of: under 20 years, 8·45; under 20–30 years, 5·09; under 30–35 years, 2·78; above 35 years, 4·26. Thus, consumption appeared the most frequently amongst children of very young mothers, whilst the frequency of it diminished with middle-aged mothers, and rose again with mothers above 35 years. According to the father we find also that the youngest and the eldest show a greater number of tuberculous children—viz., at the paternal age of: under 25 years, 5·71; under 25–30 years, 4·74; under 30–40 years, 3·61; and under 40–50 years, 6·01."

DIVISION II., THE NOTIFICATION OF TUBERCULOSIS.

A paper by Dr. HERMANN BIGGS (New York) upon

The Voluntary Notification of Advanced Tuberculosis

was then read by Dr. Janway. The author showed how this could be best encouraged and effected and what had been the experience of compulsory notification in the cities of New York, Buffalo, and Washington.

Alderman MCDOUGALL (Manchester), Deputy-Chairman of the Sanitary Committee and Chairman of the Hospitals Sub-Committee of that city, then read a paper on

The Working of the Voluntary Notification of Phthisis in the City of Manchester.

Early in 1899, he said, a scheme for the voluntary notification of phthisis was submitted to the Sanitary Committee of the City of Manchester and was accepted by them. By that committee a statement was placed before the City Council limiting the notification of cases to public institutions in the first instance. This proposal was accepted by the City Council who also accepted the entire scheme, though not for immediate execution. A highly qualified medical man, Dr. Coates, was appointed in September, 1899, to assist the medical officer of health in administering the scheme. In March, 1900, the city council accepted the further proposal that medical practitioners should be invited to notify their cases, and a second medical assistant, Dr. G. F. McCleary, was appointed. It was understood that the objects of notification were to be: (1) that the medical assistant should visit the homes of cases and instruct the household in the precautionary measures to be adopted, leaving with them printed instructions; (2) that they should determine what measures of disinfection were required; (3) that they should make inquiries into the exposure to infection of individual cases from relatives, workmates, friends, &c., into their occupations and places of work, the various houses which they had inhabited, their physique, personal habits, and so forth—in fact, into every circumstance which might be supposed to bear on the modes of infection; (4) to sustain a supervision over infected households, to ascertain change of address, and to see that personal precautions and household cleanliness were maintained and to get necessary measures of disinfection carried out from time to time; (5) to provide for the required measures of disinfection being executed; (6) to assist in getting bacteriological examinations of sputum in suitable cases; and (7) to collect information regarding households which might serve as a basis for hospital provision. To assist the medical officer of health in carrying out the scheme, besides the two assistant medical officers, there were available the services, in part, of 28 district sanitary inspectors and of 19 health visitors belonging to the Manchester and Salford Ladies' Health Society and to the Jewish Ladies' Health Society, voluntary organizations aided by the corporation. By these the cleansing and disinfecting work had been supervised and a continuous supervision had also been exercised over cases once reported. The administrative work had also required the time of two clerks in writing letters, entering records, and so forth. The following figures would serve to give an idea of the amount of work which had been done. The number of cases notified from September, 1899, to the end of March, 1901, had been 2338. Of these, 931 had been notified from hospitals and 779 had been notified from

public institutions (628 by private practitioners); total 1710. During that period the number of deaths registered from phthisis had been 1729. The total number of houses disinfected between March 31st, 1900, and March 30th, 1901, had been 2306. The methods of disinfection employed had been to disinfect articles of clothing by steam, while rooms had been disinfected by washing the floors, woodwork, &c., with soft soap and water, cleansing the walls down with dough (Esmarch's method), and limewashing the ceiling. If, however, the house was dirty, or the patient had not carried out careful personal precautions, or marks of sputum were visible on the floor or walls, the surfaces of the room were washed with a solution of chlorinated lime (one and a half ounces to the gallon). This method was adopted as the result of a special investigation by Professor Delépine. The amount of disinfection done was shown by the following figures, which, however, included disinfections after death. By corporation, with chloride of lime solution, 633; by corporation, with solution of lime, 94; chiefly by tenants, by Esmarch's method, 1579; total, 2306. He might mention that they had begun the isolation of advanced cases of tuberculosis from crowded houses, though only about a dozen were as yet actually isolated. The number of applicants for admission was large and the need for the reception in hospital of such cases was very great. With the new hospital given by Mr. Crossley the number of beds available for Manchester and district would be—sanatorium, 120; isolation, 12. To these must be added the provision made by the union hospitals and such additional provision as the corporation might make. As regards the union hospitals, he was of opinion that the taint of pauperism should be removed altogether from the sick.

Dr. M. HOLMBOE, Director of the Medical Service in Norway, then read a paper on

The Notification of Tuberculous Diseases in Norway.

He said that according to the law of May 8th, 1900, which law came into force on Jan. 1st of this year, compulsory notification of such cases of tuberculosis, which were accompanied by secretions, had been introduced in Norway. Subject to notification were: (1) new cases of such disease coming under medical treatment; (2) deaths of persons suffering from such disease; and (3) changes of residence of such persons, if it should be so agreed by the municipal council and approved by the Government. The notifications were to be given to the officer of health of the place who in Norway always was a physician; these notifications had a confidential character. The compulsory notification had been introduced in order to give the officer of health an opportunity to see that necessary cleanliness was observed in the homes of the sick, especially in the treatment of their secretions, and that a radical cleansing was made of their rooms and their garments and bedclothes before others made use of them. The law had been too short a time in force to allow anything to be said with certainty about its effects. At any rate, no complaint against inconveniences resulting from the compulsory notification had yet come to the notice of the directorate of the medical service.

Discussion on Prevention of Tuberculosis during Childhood.

Dr. S. A. KNOPF (New York) read a paper

On State and Individual Prophylaxis of Tuberculosis during Childhood and the Need of Children's Sanatoria,

of which the following is an abstract. In the first portion of the paper Dr. Knopf refuted the conception of frequent hereditary transmission of the bacillus tuberculosis and demonstrated that post-natal infection was virtually the only source of tuberculosis in infancy and childhood. He described the manner of how the child in the home of an unclean, ignorant, or careless consumptive had multiple chances of taking the disease into his system by inhalation, ingestion, and inoculation. The contraction of tuberculosis through the ingestion of milk and other food substances derived from tuberculous cows was also briefly treated. The precautions which should be taken to avoid the infection of the child from tuberculous parents and others living in the family were described in detail and so were the kind of leaflets concerning the prevention of tuberculosis which health boards should gratuitously provide to physicians, midwives, and mothers. Dr. Knopf's views concerning the so-called hereditary predisposition were set forth and may be summarised here by saying that there was inherited very often from a tuberculous mother, much more rarely from a tuberculous father, a physiological poverty which might handicap the offspring in its development and offered when occasion presented itself a suitable soil for the invasion of the bacilli of tuberculosis. Dr. Knopf was, however, convinced that many of these children, born "tuberculisable," could be protected from contracting the disease by being placed from early childhood in proper sanitary surroundings and given a prophylactic, hygienic, and dietetic treatment. Respiratory exercises for the development of the lungs were, in the opinion of Dr. Knopf, of great importance in this prophylactic treatment. The hygienic and dietetic treatment should, however, begin with the mother while the child was still in utero. The most healthful life, generous diet, comfortable garments, and breathing exercises in the open air should be prescribed for the mother during the state of pregnancy. The duties of the State and municipality in the prevention of tuberculosis in children were outlined, and the urgent need of children's sanatoria, to which schools should be attached, for tuberculous children was dwelt upon.

The French School Colonies.

M. RAOUL BOMPARD (Paris) contributed to a discussion on prevention of tuberculosis in childhood a paper on the above subject. He said that the poor child, badly nourished and overworked, was particularly liable to tuberculosis. They endeavoured in France to insure to the largest possible number of poor school-children a sojourn in the country, either at the sea or among the mountains. This project had been zealously carried out by a great number of private enterprises and by the municipalities of Bordeaux, Lyons, Marseilles, Roubaix, Lille, Agen, and Toulon. Paris devoted 279,000 francs (£11,160) a year to this object, by which more than 4000 children profited. The average length of stay was three weeks. Some societies and municipalities had bought villas to insure a longer stay for the anæmic cases. The average benefit derived was estimated approximately at an increase in weight of two kilogrammes and an increase round the chest of two centimetres.

WEDNESDAY, JULY 24TH.

DIVISION III., THE INFLUENCE OF HOUSING AND AGGREGATION.

Dr. HAROLD COATES (Manchester), senior assistant to the medical officer of health of that city, communicated to the section the results of an investigation, undertaken at the suggestion and under the direction of Dr. Niven and Professor Delépine, into

The Presence of Infective Material in Dwellings occupied by Consumptive Persons.

In 1895, he said, an investigation of this kind was commenced under the direction of Professor Delépine at Owens College but was shortly after abandoned. The establishment of a scheme of voluntary notification of phthisis in 1899 presented a favourable opportunity for taking up the investigation, and, acting on the suggestion of Dr. Niven, the hospitals sub-committee of the Manchester Corporation resolved that he (Dr. Coates) should carry out the work under the direction of Professor Delépine. Although the plan of the investigation was somewhat different the methods of experimentation pursued were in the main similar to those of Cornet, although modified in some respects at the suggestion of Professor Delépine. Specimens of dust were collected from situations in which dust from the atmosphere had settled naturally and where there would be no likelihood of direct contamination with expectoration or by infected articles. The dust was taken from the floors, crevices between the boards and between the floor and skirting board, from shelves and other similar situations, by means of a metal spatula, which was sterilised immediately before use by passing it several times through the flame of a spirit lamp until red hot and then allowing it to cool. By means of this sterilised spatula the dust was placed in a glass tube plugged with cotton-wool, which had been previously sterilised in the autoclave, the cotton-wool plug being passed through the flame of the spirit lamp when opening and replugging the tube. The tube containing the dust was then carried in a sterilised metal box to the laboratory. Small pieces of sterilised sponge carried in sterilised glass tubes plugged with cotton-wool were rubbed vigorously over an area of two square feet of wall surface and then replaced in the tube and the tube replugged with cotton-wool. The cotton-wool plug was passed through the flame on opening and replugging the tube. Sometimes

two or more pieces of sponge would be used for the same area of wall surface if this happened to be very dusty. The tube containing the sponge was then placed in a metal box and carried to the laboratory. According to Cornet's estimate the dust collected by rubbing over two square feet of wall surface would be the deposit from at least 306 cubic feet of air. On arrival at the laboratory the dust, or dust-laden sponge, as the case may be, was well rubbed up with sterilised water, and the mixture filtered through sterilised muslin, so as to remove coarse particles which might otherwise block up the needle of the hypodermic syringe used for inoculation. The emulsion thus obtained was centrifugalised and a small portion of the deposit, spread on a covered glass, stained and examined microscopically for tubercle bacilli. In only two cases out of a very large number of film preparations of the dust examined microscopically were tubercle bacilli discovered. This method was therefore practically useless for the discovery of tubercle bacilli in a specimen of dust. Cultivation methods were also useless because the dust contained many other organisms which would overgrow the slowly growing tubercle bacillus. The method employed to determine the presence or absence of tubercle bacilli in the dust was that of the inoculation of a susceptible animal—viz., the guinea-pig. The site of inoculation was on the inner aspect of the left leg, just above the level of the knee-joint, the pathological changes produced by the inoculation of tuberculous material in this situation being very definite and constant. The houses in which investigations were carried out were classified into the following groups: 1. Houses which were in a dirty condition and in which a consumptive patient was living who was taking no precautions to dispose of his expectoration so as to prevent infection of the atmosphere, but who spat freely on to the floor or into his pocket-handkerchief, &c. 2. Houses which were in a very clean condition but in which a consumptive patient was living who was not sufficiently careful as to the disposal of his sputa. 3. Very dirty houses, in which there had been no case of tuberculous disease for several years past. As a result of the inoculations many of the animals died from acute septic diseases. Those which survived were killed about one month after the inoculation and at once dissected so as to show the lymphatic ganglia and viscera. Any morbid changes were noted in a book kept for the purpose and cover-glass preparations were made from scrapings of affected glands and organs and examined for tubercle bacilli.

Of houses belonging to Class I.—infected houses in a dirty condition—23 were examined. Two of these houses had to be excluded from consideration because the results were inconclusive. All the animals died shortly after inoculation and microscopic examination of the dust was fruitless. In another house both animals died shortly after inoculation; but in this case examination of the dust revealed the presence of tubercle bacilli, and this may be accepted as evidence that the dust was infective. Therefore there are 21 houses in which definite results were arrived at. In 13 of these houses at least one animal was found to be tuberculous, and in another house tubercle bacilli were present in the dust. Therefore in 14 out of the 21 houses—i.e., in 66·6 per cent.—the presence of infective dust was proved which had at one time been suspended in the atmosphere and therefore was capable of being inhaled. In seven of the houses there was no evidence that the dust was infective. Altogether, 52 guinea-pigs were inoculated with dust from these houses; 20 of these died within a few days of inoculation, 17 were killed from four to five weeks after and found to be tuberculous, and 15 were killed from four to five weeks after and found to be healthy. Taking the conditions of lighting and ventilation in the 21 houses which gave results either negative or positive, they found that out of the 14 "positive" houses the lighting and ventilation were bad in eight houses, fair in one house, and good in only five, while of the seven negative houses the lighting and ventilation were good in six and fair in the other one. In none of the houses with negative results were the lighting and ventilation poor or bad. These facts pointed strongly to the beneficial effects of light and air, even in the dirtiest houses, where the conditions were certainly not favourable to their action. As was to be expected, those samples of dust taken within one or two feet of the floor produced tuberculosis oftener than samples taken at higher elevations. This greater infectivity of the dust nearest the floor was not due to direct infection with sputum, as all the samples were collected from places where this could not occur.

Of houses belonging to Class II.—clean but infected houses in which a consumptive patient was living who was not sufficiently careful as to the disposal of his expectoration—ten houses were brought under examination and two samples of dust were taken from each house. Each sample was used to inoculate one guinea-pig. Microscopical examination of the dust was not carried out in these experiments, as the results in previous experiments were so very unsatisfactory. 20 guinea-pigs were inoculated, and of these only three died from acute diseases shortly after inoculation. Of the remaining 17 animals, six developed tuberculosis and 11 were found free from tuberculosis at the post-mortem examination. Of the 10 rooms examined, dust capable of producing tuberculosis on inoculation into a susceptible animal was found in five; in one case both animals belonging to that room became tuberculous; in the other four rooms one animal only became affected. Thus even in the cleanest of houses infectious dust could be found in 50 per cent. of cases when the phthisical occupant was using his pocket-handkerchief or the floor as a receptacle for sputum. It was therefore evident that ordinary cleanliness alone was not sufficient to prevent the accumulation of infectious material in the rooms occupied by a consumptive. Taking the houses of Class I. and Class II. together, the influence of sunlight and fresh air in the prevention of accumulations of infective dust was shown very markedly.

Ten houses were examined of Class III.—dirty houses in which no case of tuberculosis was resident—and in no case was any tuberculous dust discovered. Twenty guinea-pigs were inoculated with dust taken from these houses, and six of these died within a few days of inoculation. The remaining 14 were killed from four to five weeks after inoculation, and all were found to be free from tuberculosis. These results, taken in conjunction with the results obtained from houses in Class I. and Class II., showed that the virulent dust found in those houses was due to the presence of a consumptive patient who was infecting the atmosphere with his expectorations. These experiments showed that living and virulent tubercle bacilli were present in the dust, which had deposited itself naturally from the atmosphere, in rooms which were occupied by phthisical patients who were in the habit of spitting upon the floor or into pocket-handkerchiefs. They also seemed to show that this infective dust was present in greatest amount or was most virulent where the access of sunlight and the free circulation of air were prevented. Such infected rooms must be a source of danger to those occupying them. Healthy persons ran the risk of being infected and the patient himself might become reinfected and his ultimate recovery be delayed or prevented.

The paper concluded with a description of the methods of disinfection in use in Manchester.

Professor VON SCHRÖTTER (Vienna) said that the best method of getting rid of tuberculous sputum was by burning it. The sputum of patients walking about was collected in a modification of Dettweiller's bottle and that of those lying in bed in papier-maché spittoons containing powdered turf. The contents of the bottles and the spittoons themselves were well mixed with turf and then burnt.

Dr. J. ROBERTSON, medical officer of health of Sheffield, then read a paper on the

Influence of Housing and Aggregation on the Prevalence of Tuberculosis.

There was at the present time, he said, ample evidence that the lighting, ventilation, and cleanliness of a large proportion of dwelling-houses, factories, and workshops were not sufficiently good to secure that degree of good health which was necessary in order to prevent the occupiers and workers being attacked by tuberculosis and other diseases. Again, there had been accumulating during past years ample evidence that, given good conditions as regards light, ventilation, and cleanliness of dwellings and work-places, the amount of tuberculosis was very much less than in places where the lighting, ventilation, and cleanliness were deficient. There was also the evidence of the mortality statistics during the last 40 or 50 years, which showed that, without any direct effort in regard to phthisis, the disease had diminished by over 45 per cent., and that in the case of all forms of tuberculosis in the human subject the decrease had been during 40 years something like 40 per cent. This diminution in the number of deaths from tuberculous disease had been coincident with a general improvement of the sanitary conditions of the people. The condition of houses in every respect was better now than it was 50 years ago; so also

there had been an enormous improvement in the conditions under which a large proportion of the labouring classes worked. This improvement was not only an improvement in the sanitary condition of the work-places in its ordinary sense, but also in regard to those special processes, such as grinding, where dust or fumes had a deleterious influence on the respiratory organs. There had also been an enormous improvement in the food-supply of the working-classes. So far as the removal of refuse in towns was concerned the improvement had been steady and was continuing at the present time. It was questionable, however, whether the cleanliness inside the dwelling-houses of the people was better now than it was 50 years ago, when so much larger a proportion of the population lived in rural areas. Personally, Dr. Robertson was inclined to think that the condition of the people as regarded cleanliness of dwelling-houses was better now than it was formerly. There could be no doubt that the general cry for the abolition of slums and the adoption of women inspectors to look after the conditions inside the dwelling-houses had been productive of good, and would continue to improve their conditions in this respect. If further evidence were required, there had been accumulating during the past 10 or 15 years an enormous amount of evidence which was extremely valuable from the point of view of preventive medicine—viz., as regarded what could be done in preventing tuberculosis in the lower animals. It had been demonstrated so frequently that the proper housing of cattle to a large extent prevented tuberculosis that it had now become almost common knowledge in the medical and veterinary professions. The demonstration that tuberculosis among cattle was not in itself hereditary was also highly important. The prevention of tuberculosis divided itself roughly into two divisions: (*a*) the prevention of the spread of infecting material, and (*b*) the strengthening of the resistance of every individual, and especially of those having a hereditary tendency towards the disease. The number of persons who had some hereditary history or hereditary tendency towards tuberculosis was extremely large—so large, indeed, that it was impossible to limit one's action in strengthening resistance to any particular group of persons. While one advocated by all means the limitation of infecting material it was even more important to be able to put this large group of the community into such a condition of environment that there would be less tendency to develop the disease. The possibility of being able to do this appeared to be a very hopeful one. No one who had had to watch delicate consumptive patients undergoing the open-air treatment for tuberculosis could doubt for a moment that fresh air, sunlight, and good food had a most potent influence on the disease. Nor could any careful observer doubt that the persons who lived and worked under good conditions as regarded air and light were very much less susceptible to tuberculosis than those living and working in ill-lighted premises. The lighting of any house or work-place did not depend alone upon the area of window, and until some good means of measuring light was obtained there would probably be little improvement on the present condition. A film of tar or soot on the windows of a town house would cut off nine-tenths of the photographically active light; a dark stone or brick building adjacent to a house would absorb nearly twice as much light as a light-coloured one. Except in the centre of cities, it was advisable that there should be no building which obstructed the light from another, no cellar dwellings should exist, and no cellars should be allowed to be used as work-places. The effect of dark offices and workshops upon the young people employed was remarkable, and there seemed to be absolutely no reason why such premises should be allowed to damage the health of the occupiers. The very difficult subject of ventilation was largely neglected in this country, owing chiefly, no doubt, to the variable temperature. Yet by insisting that workers, and especially those engaged in sedentary occupations, should carry on their work in a good atmosphere they would do more in the way of increasing the resistance against tuberculosis than by any other single means. There was difficulty in quite understanding why the small increase of carbonic acid and other impurities which occurred in a badly-ventilated room should have such a powerful effect, but that it had a powerful effect no one who had observed carefully for himself could doubt. The present cubic air-space permitted by statute in the case of factories and workshops was too small for efficient ventilation. Personally, Dr. Robertson felt very strongly that the only way to ensure proper ventilation was to insist upon a high standard of purity of air, but the difficulty in the adoption of such a standard was the very varying methods used in the estimation of carbonic acid in the air. At the present time a large number of workshops and factories never had their floors and benches washed, and yet there was no more reason why this should not be done than in the case of common lodging-houses. There were, of course, a certain number of trades where earth floors were a necessity; in all others there should be a requirement that the wood-work and floors should be washed once a week. Such a condition of cleanliness in work-places would not only be of value in itself to the workers, but would be an object-lesson of considerable importance.

Discussion on Higher Standard of Lighting and Cleanliness.

Dr. A. RANSOME, F.R.S. (Bournemouth), communicated a paper on

The Need of a Standard of Efficient Ventilation,

of which the following is an abstract. He said that consumption was a "filth disease" and flourished in atmospheres polluted with organic matter, especially of respiratory origin. The influence of this pollution was manifold and was due (1) to the presence of the bacillus of tubercle; (2) to the retention of its virulence by this organism in such atmospheres; (3) to the presence of other pathogenic organisms; and (4) to the physical condition of the persons breathing such air. Their first duty in the prevention of consumption must be to get rid of this "air-sewage" which caused more mortality than water-sewage. This work could only be accomplished by copious "ventilation." The standard of ventilation hitherto fixed for dwelling-rooms was 3000 cubic feet per head per hour, in order to reduce the amount of respiratory CO_2 to two parts per 10,000. A better method of judging the efficiency of ventilation was to take the amount of CO_2 in the air as the standard. Although it was the organic matter accompanying the CO_2 which did the harm, and although in still air these two ingredients were not always in proportion, owing to the non-diffusibility of the organic material as a test for ventilation, which swept away both, it was a good and more readily applied standard than the mere velocity of the entering or out-going currents of air. In the year 1897 a Home Office Committee, of which Dr. Ransome was a member, proposed that the CO_2 present in humified weaving sheds should be made the standard of ventilation; and this measure was embodied in the Cotton Cloth Factories Act of 1898, with the result that a great improvement had taken place in the conditions of labour in these places. A table showing the results was exhibited. Evidence was also given showing that the health of the operatives in these weaving sheds had greatly improved and that in consequence the sickness rate had diminished. The Act of 1898 only applied to a few thousands of male and female operatives, leaving several millions of others, who now performed their labour under the old conditions of insufficient air-supply. Dr. Ransome urged that the same standard should be applied to all "work places" and anticipated that the health of the people who worked in them would benefit to at least the same extent, and that the prevalence of consumption amongst them would be greatly reduced thereby. A plea was also put in for some regulation of the ventilation of other places of public assembly, such as theatres, concert-rooms, churches, chapels, &c. The question of cost was discussed and it was shown that this objection need not be prohibitive.

Dr. T. GLOVER LYON (London), physician to the City of London Hospital for Diseases of the Chest, Victoria Park, London, communicated a paper on

The Air-supply of London.

Air-supply, he said, related to habits or conditions of life. Bad air caused deterioration of health, leading to increased susceptibility to phthisis, and in extreme cases seemed to act specifically in this direction. The respiratory apparatus of the body was capable of temporary adaptations, but pure air was required, though vitiated air might be tolerated for a short time without injurious effect by some persons. Brain work necessitated better air-supply than manual labour. He defined *pure air* as air that might be breathed by most people all through the year without deterioration in health; *fresh air*, air such as would serve continuously for some time, but not indefinitely; and *vitiated air*, such as could be breathed without injurious effect for short periods only of the day. Pure air was not necessary to prevent or even to cure

phthisis, as was shown by the results at the London chest hospitals. When Queen Victoria came to the throne the general supply of air to London was perfectly good, and country air could be enjoyed within an easy journey on foot by all Londoners. The annual country health excursion was unknown. At the beginning of King Edward VII.'s reign pure air was unattainable by the majority of His Majesty's subjects dwelling in his capital. Provision of much larger spaces, within easy reach of all, was imperative, for the zones of houses built next to open country were blocked in by others one after another. For every house built or rebuilt adequate park space in near proximity to it should be provided. He considered the present regulations of air-supply to individual buildings quite inadequate, while there was no supervision of any account of the ventilation of buildings. He suggested that (1) regulations should be drawn up for the adequate provision of open spaces in the building and rebuilding of large cities; (2) in the case of schools and public assembly rooms of all kinds provision should be made to admit a standard quantity of fresh air to each person whom the schools or assembly rooms are intended to accommodate; and (3) ventilation generally should be under the supervision of the medical officer of health.

Dr. ESPINA Y CAPO (Madrid) said that the best spittoons to employ were those composed of hygienic paper to be burnt immediately after expectoration. By warning all people to use the spittoon it was possible in some degree to limit the infection. He also recommended that collecting spittoons, which must be placed everywhere, should be constructed of a material easily destructible by fire, so that they might be replaced from day to day.

Mr. C. H. GARLAND ofthe General Post-office referred to the subject of phthisis among their employés.

Dr. R. ALEXANDER, Dr. J. F. J. SYKES (London), Sir HENRY LITTLEJOHN (Edinburgh) and others also took part in the discussion.

THURSDAY, JULY 25TH.

DIVISION IV., THE INTERNATIONAL ASPECTS OF TUBERCULOSIS.

A general discussion was opened by Dr. ALFRED HILLIER (London), who was followed by delegates from various States, among whom we may mention Dr. MONTIZAMBERT, Director-General of Public Health in Ottawa; Professor F. C. ROBINSON, delegate of the State Board of Health of Maine, U.S.A.; and Dr. VAN RYN, Secretary-General of the Belgian National League against Tuberculosis.

SECTION II.

MEDICAL, INCLUDING CLIMATOLOGY AND SANATORIA.

TUESDAY, JULY 23RD.

The meetings of this section were held in the Royal Medical and Chirurgical Society's Rooms, 20, Hanover-square, W., under the presidency of Sir RICHARD DOUGLAS POWELL, Bart., K.C.V.O., who opened the proceedings with a brief introductory speech.

Dr. C. THEODORE WILLIAMS (London), consulting physician to the Brompton Hospital, then discussed

What Influence has Climate upon the Treatment of Consumption?

He said: "Climate has in all ages been considered to exercise an important influence in the treatment of pulmonary tuberculosis, though opinions have differed as to the kind of climate which is most beneficial. In South America, since early times, arrest of tuberculosis has been produced by prolonged residence in the Andes (Archibald Smith, Guilbert, and Weber) without the aid of sanatorium and other treatment, and these successes must be attributed to climate and to climate alone. Numerous authenticated instances of arrest can also be shown as the results of sea voyages, of warm and of cool marine climates, or of dry, warm climates respectively; in fact, it has been proved that the arrest of tuberculosis has occurred in a variety of climates and under very different conditions. The main object is to determine under what climatic conditions arrest of this disease most frequently takes place and what are the real causes of such improvement. In all climatic treatment care must be taken to bring the patient fully under the influence of the atmosphere and to insure a strictly open-air life, with complete hygienic measures, whether in a sanatorium or elsewhere. The climate which best fulfils these conditions need not necessarily be a warm or a cold one, but should be dry, with abundant sunshine, admitting of much exercise and producing appetite and muscular vigour. Tropical climates are excluded on account of their relaxing influence and their favouring bacillary increase.

The principal climates utilised for the treatment of pulmonary tuberculosis may be grouped as follows: (1) marine; (2) dry warm climates; and (3) mountain climates.

Of marine climates the temperate ones of the British Islands have been shown to be suitable for a large number of cases of chronic pulmonary tuberculosis, specially in its strumous form, even when accompanied by pyrexia, and for our countrymen and women the avoidance of long journeys and the certainty of abundant and good food and of home comforts are a great recommendation. The warm marine climates of Madeira, the Canaries, and the West Indies are beneficial in catarrhal tuberculosis, but not as a rule in phthisis generally. Sea voyages are probably the most successful form of marine climates, and provided (1) that the patient's cabin is well ventilated, so that he is sure of abundant fresh air by night and in stormy weather as well as by day, (2) that the food-supply be good and unfailing, and (3) that the voyage be in temperate and not in tropical seas, a sea voyage is often productive of large gain of weight and colour and leads to arrest of tuberculous disease. Sea voyages are most beneficial in (1) hæmorrhagic phthisis, (2) in strumous or scrofulous phthisis accompanied by affections of the glands or joints, and (3) in cases of chronic tuberculous cavity where the disease is limited and unilateral.

Dry warm climates include that of the Desert (especially the Egyptian) and those of the Mediterranean basin. The Desert climate is remarkable for its dryness, sunshine, and its purity and asepticity, and is especially adapted to open-air treatment. Owing to radiation the extremes of temperature are often great. General improvement in consumptives is perhaps more striking than local, but diminution in the amount of lung secretion and reduction of cough usually take place. The Desert climate appears to act more decidedly in preventing the spread of tuberculous disease than in arresting that already present. It seems to benefit most cases of chronic cavity, especially in elderly persons and patients who are incapable of much exercise. The climate of the Riviera and of the Mediterranean basin, as a whole, is cooler and more stimulating, but liable to greater vicissitudes of weather, though not of temperature, than the Desert climate It is moister than the latter and, compared to the British climate, it is clearer and brighter with a good deal of wind, but free from fog or mist, with a winter mean temperature from 8° to 10° F. higher, with half the number of rainy days and four or five times the number of sunny ones. It can be recommended in chronic phthisis, especially when complicated with inflammatory attacks, in strumous and laryngeal phthisis, and to patients with rather extensive tuberculisation of the lungs, who from feeble circulation, short-windedness, or advancing age are unable to bear the effects of a high altitude.

Mountain or high altitude climates vary according to latitude, but are all characterised by (1) diathermancy, or the increased facility with which the sun's rays are transmitted through the attenuated air, which causes a difference between sun and shade temperatures of 1° F. for every rise of 235 feet (Dennison); (2) by their asepticity, as shown by the preservation of meat for long periods; (3) by their physiological effects on the human body, as shown by the tanning of the skin, increase of both pulse and respiration rate, followed after a certain period of residence by a slowing and a deepening of the latter, and an extension of the thorax, also by an increase in the amount of urea and water excreted by the kidneys; more oxygen is absorbed and more carbonic acid is expired by the lungs. The effect on cases of early tuberculous consolidation is remarkable, local pulmonary emphysema is produced around the tuberculous nodules, and the healthy portions of the lung become hypertrophied, necessitating enlargement of the thorax, which can be proved in several ways. Expansion of the chest takes place unless opposed by extensive lung fibrosis or pleuritic adhesions.

It is suggested that the arrest of the tuberculous disease is greatly owing to the pressure on the tuberculous masses by the increasing bulk of lung tissue which by emptying vessels prevents caseation and cretification of the tubercle. Accompanying these changes are the disappearance of cough and expectoration, improvement in digestion and assimilation, gain of weight, of colour, and of muscular, respiratory, and

circulatory power. The high altitudes have produced the best climatic results of all climates in the treatment of phthisis, but they are most successful in cases of early tuberculous consolidation, where they produce complete arrest in by far the larger proportion of patients, and in hæmorrhagic phthisis, but they are not equally successful in cases of excavation which require a longer sojourn to produce arrest. The high altitudes are much more beneficial to the young than to the middle-aged of both sexes, males over 30 years of age and females under 20 benefit least. The special effects above named have been noted in the Alps, the Andes, the Rocky Mountains, and are common to all mountain ranges. The period of sojourn for patients in any climate must depend on the conditions of the climate and of the individual to be treated, and in many instances a change of climate after a prolonged stay has many advantages. Contra-indications to the various groups of climates were enumerated. All climatic treatment should be carried out under as strict medical supervision as sanatorium treatment."

Professor LANNELONGUE, Dr. ACHARD, and Dr. GAILLARD communicated a paper on

The Comparative Influence of Climate and Individual Resistance in Experimental Tuberculosis.

of which the following is an abstract. The experiments which they had made in studying the effects of climate in the evolution of tuberculosis inoculated in the pleura of the guinea-pig had taught them that this influence was inconsiderable, and had not the importance which medical prognosis had been wont to attach to it. They had enabled them, in addition, to observe remarkable differences in the progress of the disease and in the nature of the lesions in various animals of the same species which had been similarly inoculated and submitted to the same conditions of climate and food. Certain of these animals offered such a remarkable resistance that it would seem that in their cases the infection had not matured or had been spontaneously cured; some even increased in weight, and the records showed that some died quite fat whilst at the same time exhibiting lesions of generalised tuberculosis. In nearly half the number of cases the lesions remained localised in the thorax. Affections of the serous membranes, the pleura, pericardium, and peritoneum were extremely frequent and exhibited the whole series of tuberculous lesions of such membranes met with in man—dry, sero-fibrinous, purulent, and hæmorrhagic forms. A very special feature of tuberculosis in guinea-pigs, of which they had met with six examples, was rupture of the spleen with profuse hæmorrhage into the peritoneum. The spleen was often affected to such an extent that they had seen it weigh more than one-tenth of the animal. Most of the lesions met with having their counterpart in human pathology they could compare these experimental results with what was found in tuberculous human beings. It was therefore internal causes which together constituted the "soil" far more than external causes and climatic influences which determined the nature of the lesions and general progress of the disease. The chances of tuberculous infection were almost the same for a large number of human subjects; the onset was also very similar, but the progress of the disease was very different in individuals. If the number of men who resisted it was relatively considerable and larger than was the case with their guinea-pigs it was because man was less liable to tuberculosis than the guinea-pig, and he was slowly infected and in small doses, and not in wholesale doses, as in their experimental inoculations.

Dr. AMREIN (Arosa) then read an interesting paper upon

The Physiological Principles of High Altitude Treatment and their Importance in Tuberculosis.

He presented the following table of comparison of the results of different climates:—

THE RESULTS OF DIFFERENT CLIMATES COMPARED.

	No. of patients.	Average length of residence.	First stage.	Second and third stages.	Bilateral affection.	Results. General. Improved.	Stationary.	Worse (including deaths).	Local. Arrest.	Improved (including arrest).	Stationary.	Worse.
		Months.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
High altitudes ...	247	12·2	65	35	37	83·4	2·02	14·57	42·5	75·5	5·3	19·1
Sea voyages	65	1·6*	63	37	37	77·0	—	21·56	7·7	53·3	10·7	33·8
Riviera	210	9	59	41	36	65·0	10·0	24·8	5·9	36·6	17·8	45·6
Home counties ...	292	9·7	58	42	42	63·7	8·21	28·0	2·0	38·9	20·0	41·1

* Average of voyages.

Dr. P. S. HICHENS (Rosslare) read a paper entitled

A Query as to whether any Special Types of Pulmonary Tuberculosis and its Complications are Unsuitable for Treatment in the Climate of the British Isles.

He remarked that they had heard very much hitherto about the successes of the sanatorium treatment but very little about its failures. According to some writers, it might be imagined that there were no failures; but yet, even excluding the most advanced cases and the cases in which acute miliary generalisation and violent hæmorrhages intervened, there were undoubtedly cases the rate of progress of which was at any rate a considerable disappointment. Were these disappointing cases of any special type of the disease or its complications? So far as his own small experience had gone he had had types of disease the rate of progress of which had been a disappointment to him. In one type the disease had assumed a bronchitic form; in the others the disease of the lungs, in whatever form, was associated with persistent diarrhœa and very irregular pyrexia. Two cases illustrating these types of disease were described. These cases had improved but very slowly and not nearly so rapidly as had other forms of disease which might at first sight have appeared much more serious. With the exception of cases of acute pneumonia and cases associated with pleuritic effusion he had had most of the ordinary forms of tuberculous disease of the lungs and its complications under his care. The ordinary rapidly spreading broncho-pneumonic forms and chronic forms with excavation and associated with severe tuberculous laryngitis and tuberculous peritonitis had all done extremely well. He thought that it would be of great interest to know whether others had had the same experience in other types of disease in whose progress they had been disappointed. Would these types do better in a more perfect climate or would their progress be disappointing under any circumstances? The excellent results obtained by the sanatorium treatment of consumption in the British Isles were now known to all and he thought our knowledge would now be better advanced by discussing our failures than by boasting about our successes.

Dr. THEM. ZAMMIT (Malta) communicated a paper on

Tuberculosis in the Maltese Islands.

He said that the mortality from tubercle in Malta was exceptionally low. As the general death-rate was not very low, and as overcrowding and the other debilitating agencies were by no means rare, the comparative freedom from tubercle must be due to the sum total of telluric and atmospheric conditions which constituted climate. It was a well-known fact in the island that tuberculous diseases in the cattle and among the domestic animals were of rare occurrence. The

percentage of deaths from tubercle in relation to the general death-rate was as follows: During 1890, 9·2; during 1891, 9·3; during 1892, 8·9; during 1893, 9·2; during 1894, 6·3; during 1895, 6·6; during 1896, 8·6; during 1897, 6·1; during 1898, 10·7; and during 1899, 9·4—the average being 8·65 for 10 years. Comparing this with the proportion of deaths from tubercle to the general mortality of other countries they found that Malta stood at the bottom of the list. Detailed tables gathered from the official reports of the Public Health Department of Malta were given to demonstrate the fact.

Dr. TH. STEPHANI (Beauregard, Montana, Valais) communicated a paper on

Statistics and Results of the High Altitude Treatment in Pulmonary Tuberculosis.

He said that from observation of 150 tuberculous patients treated at Montana from 1897 to 1900 the following statistics were obtained:—1. Form of the disease: dry infiltrations, 34 per cent.; bronchial types, 30 per cent.; cases with cavitation, 17 per cent.; congestive forms, 13 per cent.; pleuritic cases, 3 per cent.; abdominal forms, 2 per cent.; and tuberculous adenitis, 1 per cent. The pulmonary lesions were more frequently bilateral (53 per cent.) and were more frequently situated on the right (27 per cent.) than on the left (20 per cent.). Laryngeal complications ranked in the proportion of 15 per cent. Heredity was present less frequently (44 per cent.) than it was absent (56 per cent.). The bacillus of Koch was present in three-quarters of the cases, or in almost all those in which it was possible to collect the expectoration. The transmission of tuberculosis from man to man was obvious in 80 per cent. of the cases—a fact which proved the significance of contagion. The inquiry made on this matter showed how many barracks, convents, and business offices were common foci for the propagation of tuberculosis. The part played by the pleura as a starting-point of the disease was sufficiently striking, for in 14 per cent. of the cases pulmonary tuberculosis commenced with a pleurisy, and in 18 per cent. injuries to the pleura were found to be described as having taken place several years previously to the development of the phthisis. 2. As regarded appetite, there was a decided improvement in 97 per cent. of the cases, which showed itself in 67 per cent. by a progressive rise in weight. 3. Extension of thoracic capacity, due above all to rarefaction of the air, was frequently noted. 4. The cardiac troubles ascribed to high altitudes had only been noticed in one out of the 150 cases; it was a case of congestive tuberculosis, with malformation of the heart that had already been diagnosed when in the plain. 5. Nervous affections had not been observed. 6. Hæmoptyses did not appear to be any more frequent at high altitudes than on the level, since 35 per cent. had manifested them when at home, and not at the sanatorium, while only 1½ per cent. of the patients had hæmoptysis for the first time at the sanatorium. 7. Fever was often combated most effectually by the Alpine climate—it had yielded, in fact, in 60 per cent. of the cases. 8. As to the results from the point of view of actual recovery, high altitude treatment gave the following figures: 12 per cent. completely cured; 50 per cent. improved and half cured; 20 per cent. with condition stationary; and 18 per cent. with condition worse, or with fatal issue. The 12 per cent. of cures might be subdivided thus: febrile cases with cavities and laryngitis 0·7 per cent., or 4 per cent. of cavities; congestive cases without fever 0·7 per cent., or 5 per cent. of congestive cases; bronchitic cases with fever 0·7 per cent., and bronchitic cases without fever 1·3 per cent. (2 per cent., or 7 per cent. of bronchitic cases); cases of dry infiltration—febrile with laryngitis 0·7 per cent., afebrile with laryngitis 0·7 per cent., and afebrile without laryngitis 0·7 per cent. (6·4 per cent., or 24 per cent. cases of dry infiltration); pleuritic afebrile cases 0·7 per cent., or 25 per cent. of pleuritic subjects; and cases of abdominal tuberculosis 0·7 per cent., or 33 per cent. of cases of abdominal tuberculosis. It was therefore the cases of dry infiltration (a group which embraced three-fourths of the incipient cases of tuberculosis) that furnished the most hopeful percentage of recovery. Afebrile forms were more favourable than were the febrile. Laryngeal complications, although troublesome, did not render cure impossible. Two-thirds of the cured cases were free from hereditary taint, which went to prove that the non-hereditary cases had a better chance of recovery. Dr. Stephani arrived at the following conclusions:—1. The high altitude treatment was indicated in all forms of tuberculosis. 2. The treatment yielded on an average 12 per cent. of complete cures, 50 per cent. of improvements, 20 per cent. of cases in which the tuberculous process was arrested, and 18 per cent. of failures. 3. The more a case conformed to the type of an incipient tuberculosis of the pleuritic or dry form, free from pyrexia or other complication and devoid of hereditary taint, the greater was the chance of recovery. 4. The treatment was only contra-indicated in cases of the asthmatic or congestive type accompanied by cardiac disease.

A paper by Dr. P. JONNART and Dr. GUETSCHEL was then read embodying the Results of the High-altitude Cure at the Sanitorium d'Hauteville, Ain, France, in which by statistics of results obtained at the sanatorium after nine months' working they arrived at the indications and contra-indications of the high-altitude cure.

WEDNESDAY, JULY 24TH.

The proceedings of the section were opened on Wednesday morning by Dr. G. A. HERON (London) who started a discussion upon

The Therapeutic and Diagnostic Value of Tuberculin in Human Tuberculosis.

Dr. HERON said that it had been laid down that the curative possibilities of tuberculin were confined to comparatively early stages of the disease. His belief was that tuberculin would be regarded as one of the most remarkable of the discoveries given to mankind by Professor Koch.

Professor R. KOCH (Berlin) said that tuberculin had a diagnostic and a therapeutic value. A single injection was sufficient to give a correct diagnosis in 97 to 98 per cent. of cattle. In the human subject it was very valuable and without danger if properly injected. When the first injection gave a faint reaction a second injection of the same quantity frequently, or indeed generally, gave a very marked reaction. From the study of over 3000 cases he had come to the conclusion that as a diagnostic test tuberculin was almost absolute. It was very valuable in cases of apical pneumonia, especially when influenza was suspected, and also in cases of pleurisy. In early uncomplicated cases it was of great value when used therapeutically and a complete cure frequently followed. To obtain the full value the temperature should be normal before the injections were begun.

Sir RICHARD DOUGLAS POWELL (London) pointed out that in the cases of mixed infection Professor Koch admitted that tuberculin was not very advantageous.

Professor W. OSLER (Baltimore) said that in the Johns Hopkins Hospital tuberculin was used as a routine diagnostic method. Tuberculin was harmless, but as a therapeutic agent it must have a limited value.

Dr. B. FRAENKEL (Berlin) pointed out that the danger of tuberculin was that the doses given were too large and increased at too short intervals, but when these errors were avoided the results were beneficial.

Dr. DENYS (Louvain) found that the injection of tuberculin subsequently to that of tubercle bacilli exercised a delaying influence; without tuberculin the animals died with disseminated tuberculosis.

Dr. CHARLES DENISON (Denver) read a paper on the Uses of Tuberculin.

Dr. C. THEODORE WILLIAMS (London) dissented from the view that tuberculin was harmless. At the Brompton Hospital for Diseases of the Chest his experience was that tuberculin in cases of early phthisis caused destruction of lung tissue and even if temporary arrest of the disease was secured cure was not certain.

Dr. MCCALL ANDERSON (Glasgow) said that for diagnosis tuberculin was invaluable, and therapeutically in external tuberculosis it was nearly always beneficial. In internal tuberculosis the relapses were caused by something else besides tuberculin

Dr. A. K. STONE (Boston) gave the history of the injection of tuberculin upon himself with uncertain results.

Dr. E. FRANCE (Claybury) had inoculated 75 patients, and he concluded that the value of tuberculin in diagnosis was very great.

Dr. E. OTIS (Chicago) asked Professor Koch the reason of syphilitic patients sometimes reacting to tuberculin.

Dr. W. R. HUGGARD (Davos) related the histories of cases of phthisis which became far worse after the injection of tuberculin.

Professor W. NOLAN (Leyden) said that if patients were at work a rise of temperature was not necessarily a sign of mixed infection

Dr. HERON said that he had never known a reaction to tuberculin in a syphilitic patient who was not also the subject of tuberculosis.

Professor KOCH ended the discussion and stated that the tuberculin was from human tubercle bacilli. Reaction occurred both in man and in cattle. The two bacilli were not the same, but had a common "group" reaction. In treatment with tuberculin the patients should be in bed. There should be no antagonism between treatment by tuberculin and out-door treatment, they should be carried out simultaneously.

Dr. S. ARLOING and Dr. P. COURMONT (Lyons) then communicated a paper on

Technique and Results of the Serum-Diagnosis in Tuberculosis.[1]

of which the following is an abstract. The employment of homogeneous cultures of the bacilli of human tuberculosis in glycerinated broth offered a means of investigating the agglutinising power of secretions and especially of the serum in tuberculous animals and men. In this sense the serum-diagnosis of tuberculosis was an easy and rapid method and one absolutely innocuous to the patient. The only real difficulty consisted in obtaining cultures suitable for the purpose. Their researches in the most varied cases of human tuberculosis showed that a positive serum reaction in a suspected subject would be a most valuable sign in establishing the existence of visceral tuberculosis. A negative reaction in a suspected case would help in excluding a diagnosis of tubercle. The serum-diagnosis of tubercle was therefore most valuable, especially in the preliminary diagnosis in cases suspected of early pulmonary lesions. Many authors had verified and confirmed these facts—Ferré, Mongour, and Buard at Bordeaux; Mosny in Paris; Bendix and Romberg in Germany, and others. But some others had not succeeded in keeping the homogeneous cultures or, at least, had not achieved satisfactory results in their use. This was doubtless owing to the variations in the properties of the cultures in the hands of different experimenters and to the difficulty of estimating, in the cultures, the conditions favourable to agglutination. To obviate these difficulties they had for some time past employed cultures, the growth of which had been arrested by the use of formol at the time when they presented the most favourable conditions. Large quantities of cultures ready for use might thus be prepared, and would retain their properties for a long period. It was easy to send such cultures, specially adapted for serum reactions, long distances, and thus to make a large number of reactions with an agglutinable material of an identically similar kind. By using these formolin cultures, the properties of which were standardised once for all, they had obtained still more exact results, completely confirming the conclusions set forth above. Serum-diagnosis, by the use of homogeneous liquid cultures, might be of great assistance in the diagnosis of the nature of surgical lesions. The following were the statistics of the results of 66 observations:

—	Positive reactions.	Negative reactions.
Non-tuberculous lesions: 11 cases	0	11
Lesions clinically tuberculous: 55 cases	41, or 74·54 per cent.	14, or 25·66 per cent.

These 66 patients all belonged to the surgical division. The tuberculous subjects showed most diverse localisations: osteo-articular, osseous, glandular, and cutaneous. It had seemed to them that the serum reaction was more constant and frequent in cases which ran a favourable course, and that the graver cases gave a larger number of negative reactions. So that from a practical point of view a positive serum reaction was a sign of great value in favour of the existence of surgical tuberculosis.

Dr. ALBERT ROBIN (Paris), Member of the Academy of Medicine, Delegate of the Academy of Medicine of Paris, read a paper on

The Nature and Diagnosis of the Habitat in Tuberculosis: Therapeutic Considerations.

of which the following is an abstract. He said that the prophylaxis of tuberculosis did not consist solely in the measures taken, either publicly or in private, against the infective agent. A study of the respiratory exchanges enabled one to recognise predisposed subjects beforehand and consequently to submit them to a hygienic and therapeutic regimen capable of modifying the functional and nutritive fault which was the necessary antecedent condition for the development of the bacillus. The respiratory exchanges were increased in 92 per cent. of the subjects of confirmed tuberculosis and in 63 per cent. of those with a tuberculous heredity. Alcoholism and the different forms of overwork increased the respiratory exchanges and were capable of creating a soil for tuberculosis in the same way as heredity. An examination of the respiratory exchanges, therefore, enabled a diagnosis of tubercle to be confirmed in doubtful cases. The action of different drugs and methods of treatment on the respiratory exchanges enabled one to select those which were capable of modifying the soil and opened up a new mode of prophylaxis as well as of treatment in tuberculosis.

Dr. G. E. PAPILLON (Paris), consulting physician to the Hospital Lariboisière, communicated a paper on

The Hereditary Arthritic Forms of Pre-tuberculosis.

In heredo-arthritic people, he said, the pre-tuberculous stage might be disclosed by any arthritic manifestations, such as fits of asthma, attacks of subacute rheumatism, late appearance of "*stigmates de l'arthritisme.*" These were not tuberculous localisations, as the "tuberculous rheumatism" described 10 years ago by Poncat, but only effects of the bacillary toxins. These fits of asthma, rheumatic attacks, arthritic deviations, &c., were the symptoms of hereditary disorder. They affected the contractibility of the bronchial muscles, the secretion of the articular synovia, or the nutrition of the bone ends, cartilages, and peri-articular muscles; they were manifestations of a sympathetic reaction to tuberculous intoxication.

Dr. SAMUEL BERNHEIM (Paris) communicated a paper on

The Transformation of Tuberculous Soil Deficient in Acidity into an Arthritic Soil with Excess of Acid.

He commenced by studying the character of the tuberculous soil, the bio-chemical condition of which should be well known to everyone at the present day. The measure of the mineral richness and of the chemical condition of the organism might in some degree be the measure of its resistance. But they knew that the tuberculous patient possessed a soil deficient in mineral constituents, wanting in chlorides, lacking phosphates, and above all deficient in acids, whilst the arthritic patient had a soil that was over-mineralised, exceedingly rich in chlorides and super-abundant in acidity. That was to say, in chemical language, these two soils were in inverse proportion to one another. Similarly, from a clinical point of view, there existed a kind of antagonism between tuberculosis and the arthritic diathesis. Phthisis was rare among arthritics and of benign manifestation in them. From these first data—chemical, biological, and clinical—Dr. Bernheim drew numerous therapeutic deductions. It was thus, according to him, that the system of sanatoria, the absolute rest, the abundant feeding, the high-altitude cure, had no other end and no other effects than the transformation of the soil. All these beneficent factors, which had less effect on the bacillus than on the general system, tended to increase the organic acidity of the patient. In fact, Dr. Bernheim had submitted a certain number of patients to complete repose, and he had proved in their case, at the end of a certain period, the existence of a very evident increase in urinary acidity. Similarly, the meat cure, so highly recommended by M. Riches and M. Héricourt, did not act by means of antitoxins, but by a transformation of soil the acidity of which they enriched. After having thus given an interpretation of facts, Dr. Bernheim added that it was possible to obtain this transformation of soil, especially in the case of tuberculous patients who were treated early, by a hygienic and dietetic regimen and by saturating the general system with a powerful acid, such as phosphate of creasote or phosphoric acid. At the Anti-Tuberculous Dispensary of Paris he had observed a large number of patients in whom he had frequently estimated the urinary acidity. Now he had proved that under the influence of phosphate of creasote, taken in doses of three grammes every two days, the acidity rapidly increased and the general condition improved; hence they were right in concluding that it was possible, by artificial methods, to transform a soil deficient in acid and favourable to tuberculous evolution

[1] Vide Congrès pour l'Étude de la Tuberculose, Berlin, 1899; Zeitschrift für Tuberculose und Heilstättenwesen, 1900, Band ii., and Gazette des Hôpitaux, Dec. 1st, 1900.

into a hyperacid soil and one that was antagonistic to Koch's bacillus. This transformation, which was, according to Dr. Bernheim, the sheet-anchor of the subject of phthisis, should be sought by means of, and perhaps obtained by, a hygienic and dietetic regimen, as well as by powerful therapeutic measures.

Dr. E. MOSNY (Paris) communicated a paper on

Para-Tuberculous Hereditary Dystrophy.

Clinical study and experimental medicine, he said, demonstrated the fact that subjects of phthisis did not transmit the bacillus of tuberculosis to their offspring, and that the very rare cases of congenital tuberculosis were due to intra-uterine contamination of the fœtus by the tuberculous mother. Clinical observations, moreover, went to prove that subjects of phthisis did not transmit to their offspring either a specific predisposition to bacillary contamination or any marked degree of immunity. But they should not, however, conclude from this that tuberculosis of parents exercised no influence on the health of their offspring. Both clinical and experimental medicine, indeed, agreed in demonstrating that the tuberculosis of parents had an influence on fecundity and the products of conception similar to that which was exercised by the majority of chronic intoxications. These consequences, early or late, of the tuberculosis of parents on their future descendants might be conveniently grouped under the title "Para-Tuberculous Hereditary Dystrophy." Their frequency was a witness to the grave evil or tuberculosis from a social point of view. Generalised manifestations of hereditary dystrophy appeared at all stages of existence; from conception, or during the course of pregnancy, they were shown by sterility, death of the fœtus, abortion, and premature birth; when pregnancy arrived at its normal limit, by still-birth, weakness of the offspring, which was reared badly, pined away, and died prematurely without adequate cause, or, indeed, survived in a piteous condition, badly or incompletely developed, a fit subject for all forms of decay, and exposed without defence to all kinds of contamination. At other times the influence of the tuberculosis of parents on the health of their offspring localised itself, or showed itself under multiple forms of most varied manifestation, the consequences of arrest or perversion of normal development. Among these localised manifestations of para-tuberculous dystrophy the following appeared with a frequency that was very marked: hypoplasias of the vessels and blood, pure mitral stenosis, stenosis of the pulmonary artery, generalised stenosis of the arteries (arterial aplasia), and chlorosis. Generalised or localised manifestations of para-tuberculous hereditary dystrophy, and the functional troubles which sometimes depended on them, became apparent, either at birth or not till later at one of the important stages of growth—e.g., weaning, dentition, or puberty. Tuberculosis of the father or that of the mother, above all the latter, was the determining course of these dystrophic congenital defects. Tuberculosis of the parents no more predisposed the offspring to bacillary contamination than it conferred immunity against attack. But the offspring of phthisical subjects, organically and functionally imperfect, weak from the time of birth, and more tried than others by the vicissitudes of growth—seemed to be predisposed to bacillary infection, because the risks of contagion were multiplied infinitely by contact, immediate and continuous, with contaminated parents, and because their weakened frame offered less resistance to the infection so produced. The apparent immunity of some descendants of tuberculous subjects who carried with them certain manifestations of para-tuberculous hereditary dystrophy, was, in reality, the consequence of the very nature of the dystrophic lesion or of its localisation and not the manifestation of a real condition of resistance. Such was the relative immunity in regard to tuberculosis exhibited by the subjects of chlorosis or pure mitral stenosis.

A paper by Dr. P. HAUSHALTER and Dr. A. FRUHINSHOLZ (Nancy) was communicated entitled:

The Frequency and Significance of Tuberculosis of the Tracheal and Bronchial Glands in Miliary Tuberculosis of Children and in Tuberculous Meningitis.

In 78 necropsies of miliary tuberculosis in children below 12 years of age tuberculosis of the tracheal and bronchial lymphatic glands was met with 74 times (about 95 per cent.); in 67 cases there was tuberculous meningitis, and in 64 of these affection of the glands was present. This glandular affection had always the character of an old and caseous tuberculosis; in 29 cases it coincided with old tuberculous lesions of the lung, generally localised; in 44 cases it formed the only old tuberculous lesion present. In almost all cases, therefore, the origin of the bacillary infection which ended in the miliary form and in meningitis was in caseous tracheal and bronchial glands. The frequency of this lesion was a proof of the importance of aerial contagion of tuberculosis in children. How did this tuberculous affection of glands, which was more developed and deeper-seated in the miliary than in any other form of tuberculosis, end in the bacillary infection of the blood which was considered almost the sole cause of the miliary form and of the meningitis? In spite of the intimate relations of the vessels at the base of the heart with the masses of caseous mediastinal glands—relations which were shown by the drawings exhibited—they had failed to find, macroscopically or microscopically, any lesion of the walls of the vessels that could explain the direct passage of the bacilli from the lymphatic glands into the blood. The bacillary infection of the blood took place through the lymphatic system. In the very brief time occupied by the passage of the bacillus-bearing leucocytes from the caseous lymphatic glands of the mediastinum into the blood-stream, passing as they did by efferent lymphatics, and by a short section of the thoracic duct or of the great lymphatic trunks—the destruction of the bacilli had not time to be effected. Even in many of the cases in which pure meningitis existed without generalised miliary infection, and in which a person would therefore be tempted to look for the origin of the infection not in the blood-vessels but in the lymphatics, it was probable that there existed a general bacillary infection, the manifestations of which were not appreciable to the naked eye or were exceedingly scattered. This they had been able to prove on several occasions.

On the Value of the Rectal Temperature in Pulmonary Tuberculosis.

Mr. C. BRAINE-HARTNELL, resident physician to the Cotswold Sanatorium, communicated a paper to prove that the rectal temperature was most important as an indication of the activity of tuberculosis and was therefore valuable in giving a prognosis. Rectal temperature, he said, indicated activity of the disease when both the oral and axillary records showed no rise of temperature, and he exhibited charts showing how valueless oral temerpatures might be and therefore misleading.

THURSDAY, JULY 25TH.

Sanatoria for Consumption.

A discussion upon this subject was opened by Professor CLIFFORD ALLBUTT (Cambridge) who was followed by Dr. J. KINGSTON FOWLER (London) and Dr. R. W. PHILIP (Edinburgh). A report embodying the experience of sanatorium treatment in England was read by Dr. BURTON-FANNING (Norwich), who had drawn it up. Among the papers contributed to the section may be mentioned: A Plea for Seaside Sanatoria, especially for the Prevention and Treatment of Scrofulous Complaints, by Sir HERMANN WEBER (London); The Open-air Treatment in Institutions and in Nursing Homes, by Dr. E. SYMES THOMPSON (London); The Villa Sanatoria at Cannes, by Dr. BARADAT (Cannes); Results of Sanatorium Treatment in Poorer Patients, by Dr. JANE WALKER (London); The Alice-Fagniez Sanatorium at Hyères, by Dr. EMILE VIDAL (Hyères); The Pasteur Hospital at Havre, by Dr. FROTTIER (Havre); The Incidence of Consumption in the Halifax Poor-law Union, by Dr. T. M. DOLAN (Halifax); The Gorbio Sanatorium at Mentone, by Dr. MALIBRAN (Mentone); and The Responsibility of the Medical Profession with regard to Cases of Tuberculosis, by Dr. N. D. BARDSWELL (Aberdeen).

SECTION III.

PATHOLOGY, INCLUDING BACTERIOLOGY.

TUESDAY, JULY 23RD.

The meetings of this section were held in the Queen's Hall, Langham-place, under the presidency of Professor G. SIMS WOODHEAD, M.D. Edin., F.R.S. Edin., Professor of Pathology in Cambridge University.

Dr. ALFRED MOELLER (Berlin) and Dr. WILLIAM BULLOCH (bacteriologist to the London Hospital), opened a discussion on

The Morphological and Physiological Variations of the Bacillus Tuberculosis and its Relation (a) to other Acid-proof Bacilli and (b) to the Ray Fungus and other Streptothrices.

Dr. Moeller's contribution will be found in full upon

p. 204 of this issue of THE LANCET. Dr. Bulloch said that so far as was known the bacillus tuberculosis discovered by Koch was the only immediate cause of all forms of human tuberculosis. In the majority of cases the micro-organism was met with in the form of slender rods which frequently showed clear spaces in their interior. Under certain conditions which were at present imperfectly understood the micro-organism might show filaments, true dichotomous branching, and club formation, and, in the tissues, especially in experimental tuberculosis, it might assume a radiate arrangement—characters which from a taxonomic point of view brought it into close relation with a large group of micro-organisms variously designated streptothricese, oospora, nocardiacese, and more recently actinomycetes (Lachner-Sandoval). According to all experience, the tubercle bacillus was an aerobic facultative parasite which grew extremely slowly outside the body and for its growth required a relatively high temperature, the minimal and maximal limits of which were 29° C. and 42° C. This fact was against the supposition that the tubercle bacillus multiplied extra-corporeally, at least in temperate climates. In general, cultures were difficult to obtain and were best prepared by growing the organism upon relatively complicated media, such as blood serum. The addition of glycerine to all media undoubtedly favoured the development and luxuriance of the cultures. In the presence of this substance, however, good growths could be obtained in vegetable media, such as potato (Pawlowsky, Lubinsky, and others). It was also possible to obtain growths on media which contained no proteid material, the carbon and nitrogen demands of the organism being fulfilled respectively by ammonia salts and glycerine. Hitherto in such simple media it had not been possible to replace the glycerine by other allied compounds (Proskauer and Beck). With ordinary hydro-alcoholic solutions of basic anilin colours the tubercle bacillus was stained with extreme difficulty and imperfectly. If certain substances (anilin, para-toluidin' meta-toluidin, benzaldehyde, carbolic acid—in practice the latter was chiefly used) were added to the basic dyes the penetrating power of the latter for the tubercle bacillus was increased in high degree, and on subsequent treatment with mineral acids (33 per cent. nitric acid, 25 per cent. sulphuric acid) the colour remained in the bacilli, so that they stood out prominently from other objects in the association with which they might be. This "fastness" towards acids (Säurefestigkeit), discovered by Ehrlich, had had a great influence on the development of the study of tuberculosis and at the present day the microscopical diagnosis was made with this method alone. The acid-fastness was, however, not specific to the tubercle bacillus, but was also possessed by a considerable number of other bacilli, some of which were pathogenic for man (bacillus lepræ) and some for animals. In recent times the number of these had been considerably increased, and although they had been found as saprophytes and capable of living at relatively low temperatures they might produce tubercle-like diseases in animals. The microscopical diagnosis alone was not sufficient to differentiate the true tubercle parasite from other "acid-fast" organisms. There was every reason to believe that the bacilli of human and bovine tuberculosis were identical. The bacillus of avian tuberculosis presented points of difference, but these were not differences of species. There existed a group of acid-fast, tubercle-like bacilli widely distributed in Nature. The identity or non-identity of these with Koch's bacillus was not proven. In any case, a microscopical diagnosis of Koch's bacillus, especially in objects which were from their nature and source liable to contamination with other acid-fast bacilli, was not decisive by itself. Even the application of alcohol subsequently to acid was not capable of differentiating the tubercle bacillus from others like it. Some tubercle-like bacilli might be as *säurefest* and *alcoholfest* as Koch's bacillus. Contrary to former beliefs, the acid-fastness was not due to the presence of fat in the bacillus, as after complete removal of this substance the bacilli were still acid- and alcohol-fast. The acid-fastness was due to a body of the nature of a wax (Aronson) which could be extracted by acid-alcohol-ether, boiling chloroform, and boiling benzene. This wax in itself was powerfully acid-fast, but was unstainable by fat stains. (Sudan III. and Ponceau R.) Besides wax and fat, which were present in relatively large amount, the tubercle bacillus was composed of proteids (important among which was a variety of nucleic acid described as tuberculinic acid—Ruppel) and salts (with phosphates predominating). After the removal of all proteids, wax, and fat, a substance remained which contained a considerable quantity of nitrogen and from its reactions was probably chitin or some allied body. No certain facts were known of the possession or non-possession by the tubercle bacillus or other acid-fast bacilli of true endospores. Although the tubercle bacillus was more resistant to injury than non-sporing microbes, it was much less resistant than true endospores.

Professor J. G. ADAMI (Montreal) thought from the study of the cultures in the museum of the Congress that the time had hardly arrived to lay down definite laws as to the identity or otherwise of the acid-fast bacteria. Too much stress could not be laid upon the recommendation of the American committee that all bacteriologists should work with standard media and he felt sure that the solution of the problems would be found in following those lines.

Dr. E. J. MCWEENEY said that the inter-relationships of the acid-fast bacteria were so extremely complex that it was as yet not possible to pronounce upon the individuality of the tubercle bacillus and he agreed that the tubercle bacillus was closely allied to the streptothrices.

Professor MARMOREK, director of the Institut Pasteur in Paris, drew attention to the increasing number of acid-fast bacteria which were being discovered. The close resemblance between the external appearances of these acid-fast bacteria made it necessary to be very careful in drawing distinctions between the tubercle bacilli and the para-tubercle bacilli. It was the duty of every bacteriologist to endeavour to simplify the question as much as possible.

Dr. H. KOSSEL (Berlin) quoted some experiments of Dr. Weber concerning the identification of the tubercle and pseudo-tubercle bacillus. According to his experience, no acid-fast bacterium which was not the tubercle bacillus produced after injections into animals progressive tuberculous lesions, such as those produced by the true tubercle bacillus.

Dr. WILLIAM BULLOCH, in his reply, agreed with Dr. Kossel in that the injection of acid-fast bacteria other than tubercle bacilli injected into animals in the laboratory did not, in his experience, lead to tuberculous lesions. He held that it was possible to diagnose tubercle bacilli by inoculations and subsequent cultures from the inoculated animals.

Infectivity of Milk.

Dr. LYDIA RABINOWITCH (Berlin) read an interesting paper on the Infectivity of the Milk of Tuberculous Cows, the Reliability of the Bacteriological Diagnosis, and its Practical Importance in the Extirpation of Bovine Tuberculosis. In 1899 the author, in conjunction with Dr. W. Kempner, showed that tubercle bacilli could occur in the milk of animals suffering from latent tuberculosis where the disease could only be detected by means of tuberculin. She considered the only reliable test of the presence of tubercle bacilli in milk to be the animal experiment, and concluded by stating that the frequency of tuberculosis among calves, as well as the great increase among swine in recent years, offered the best proof of the assertion that the milk of tuberculous animals was the chief cause of the dissemination of tuberculosis among them.

Dr. J. E. MCWEENEY, bacteriologist to the Local Government Board of Ireland, read a paper on the Infectivity of the Milk of Cows which React to the Tuberculin Test in the absence of Clinical Evidence of Tuberculosis, in which he said that from his experience with herds of high-class dairy cows he came to the conclusion that tuberculous mammitis was a rare disease among cattle, even although the cows suffered from other forms of tuberculosis. Sixteen cows suffering from tuberculosis but without lesions of the udder were made the subjects of experiments. The milk of these cows was frequently examined for tubercle bacilli but without any success. The persistent negative results led him to suppose that in retailing milk tubercle bacilli found an entrance from dirty pails, from sputum, or from other sources.

Professor NOCARD (Alfort) considered that milk produced by a cow the subject of tuberculous mammitis was free from danger for the calves, but was the source of the greatest danger for pigs, especially in the countries where the production of butter and cheese was considerable.

Professor J. G. ADAMI pointed out that even if the measures adopted saved only a minute proportion of the helpless infants it was their duty both privately and publicly to take every step necessary for the salvation of that minute proportion.

Professor HAMILTON (Aberdeen) raised the question as to whether a calf became tuberculous when suckled by a cow the subject of tuberculosis but with sound udders. The experience in Aberdeen was that calves fed under these circumstances did not become tuberculous.

Dr. RAVENEL (Philadelphia) said that the feeling among workers in Philadelphia was that the tubercle bacilli could pass into the milk through a perfectly sound udder when the cow was suffering from tuberculosis elsewhere. In America the tuberculin test was looked upon as practically the only method of diagnosis.

Professor SIMS WOODHEAD (Cambridge) felt strongly, despite much that had been said to the contrary, that if a cow suffered from mastitis and gave the tuberculin reaction the milk from that cow should be condemned or sterilised. He was certain that in many cases the tubercle bacilli could not withstand the action of the alimentary canal, but could find an entrance through the tonsil.

Professor B. BANG (Copenhagen) thought that it was very unfair to condemn the milk of a cow with sound udders which happened to give the tuberculin test, as he did not think that such a cow would yield tubercle bacilli in sufficient numbers to be harmful.

On Wednesday, July 24th, this section sat in conjunction with Section II.

THURSDAY, JULY 25TH.

The Varieties of Tuberculosis.

Professor BENDA (Berlin), Professor DELÉPINE (Manchester), and Professor D. J. HAMILTON (Aberdeen) opened a discussion on this subject.

Dr. TATSUSABURO YABÉ, principal medical officer of the Japanese Navy, read a paper upon

Immunity in Tuberculosis,

in which he gave an account of his own researches in respect of the sero-therapy of tuberculosis. When, said Dr. Yabé, Professor Koch made his famous discovery in 1890 of the influence exercised by previous tuberculosis upon consecutive inoculation, and proved this influence by experiments upon guinea-pigs, he demonstrated the possibility of securing immunity from the disease. In the laboratory of Dr. Roux at the Pasteur Institute in Paris Dr. Yabé, in 1896, made certain researches into the existence and nature of this immunity. Tuberculin he saw to have no immunising action, and he sought to separate other toxins which would account for the phenomena of tuberculosis. He obtained three substances from the bacillary bodies: (1) the waxy substance discovered by Aronson; (2) a body which he called "tuberculo-mycoprotéine"; and (3) a body of undetermined chemical character, "tuberculo-bactéricidine." He found both the latter two substances to give immunity, but the "tuberculo-mycoprotéine" was not so effective as the "tuberculo-bactericidine." From his work he came to the conclusions that the disease was curable, that immunity against tuberculosis could certainly be obtained, and that protection could be secured by "vaccination," but he was not prepared as yet to practise the injection of the new substances which were very toxic. The direction of his further researches would be towards obtaining a serum which should be antitoxic as well as bactericidal.

SECTION IV.

TUBERCULOSIS IN ANIMALS.

TUESDAY, JULY 23RD.

The meetings of this section were held in the Marlborough Hall, Regent-street, W., under the presidency of Sir GEORGE BROWN, C.B., the Governor of the Royal Veterinary College.

The Diagnosis of Tuberculosis in Animals during Life.

A discussion upon this subject was opened by Professor DEWAR, Principal of the Royal (Dick) Veterinary College, Edinburgh.

Professor DEWAR said that increased experience led him to believe that the number of tuberculous cows affected with tubercle of the udder was greater than that usually estimated—i.e., about 3 per cent. For the successful use of tuberculin as a diagnostic agent several things were required: first, a thoroughly reliable tuberculin; secondly, that the herd to be tested should be kept quiet and undisturbed; and thirdly, that the veterinary surgeon should be allowed freedom and facility in the application of the test. When every precaution was taken and the test carefully supplied at least 90 per cent. of the results would be correct and definite.

WEDNESDAY, JULY 24TH.

Tuberculosis and the Milk-supply.

Mr. JOHN A. W. DOLLAR (London) opened a discussion by reading a paper on the above subject of which the following is an outline:—The relations of bovine and human tuberculosis and their intercommunicability. Transmission of bovine tuberculosis to man; necessity for a certain concentration of the bacilli in transmission by the digestive tract. Reservations in regard to accepting results of inoculation and feeding experiments in rodents as applicable to man. Intestinal tuberculosis in children; rarity of primary tuberculosis of the bowel in children and in men; possible reasons for this. Bovine tuberculosis in Europe; proportion of tuberculous cows as shown respectively by slaughter-house statistics and by tuberculin test; proportion of cows with tuberculosis of the udder. Tuberculosis common to goats, asses, and sheep, as well as to cows. Detection of tubercle bacilli in milk as sold. Methods of preventing the spread of tuberculosis by milk. Sterilisation and pasteurisation of milk, their advantages and drawbacks. Examples of commercial establishments supplying pasteurised milk. Sterilisation of milk on a commercial scale. The eradication of tuberculosis from herds of milch cows. Examples of commercial establishments supplying milk from guaranted tubercle-free herds; their success. Improved hygienic treatment of milch cows; Bang's system of stamping out tuberculosis. Experiments on Bang's system in Belgium, Canada, and the United States of America. Tuberculosis in New Zealand. Legislation in regard to milk traffic proposed by German Milk Trade Union.

Mr. EATON JONES (Liverpool) advocated the practical measures which have to be employed to get rid of the danger to human life and health in the use of tuberculous milk. He said that whatever loss the farmer had to incur for the good of the public should be made good to him by the public purse. He had very great doubts on the propositions made by Professor Koch on the previous day, and they ought to go on protecting the public from this insidious disease as they had begun to do.

Professor MCLAUCHLAN YOUNG said that he had long held that it was surprising that the authorities should be so strict in their inspection of meat and so lax in their inspection of milk. It would be of material aid if they had power to apply the tuberculin test to dairy animals.

Mr. JAMES LAITHWOOD (Cheshire) said that so far as the milk-supply was concerned it was an easy matter to prevent the disease. He recommended the establishment of a State veterinary service as had been instituted in Italy. He would include the disease in the Contagious Diseases (Animals) Act, and was of opinion that only a qualified veterinary surgeon should be permitted to use tuberculin on animals. He thought that the public ought to pay for the services of these qualified men, as they were the people who benefited by it. He pointed out that it did not follow that because a cow had no appearance of a diseased udder its milk was perfectly safe for consumption. He concluded by referring to the work of the Manchester Dairy Milk-supply Company.

Professor STOCKMAN did not consider that sufficient provisions were made to prevent improper milk-supply. All udder disease should be notified. The inoculation of animals was not a practical measure. As regards compensation the dairymen would not accept any scheme that would not involve the expenditure of impossible sums of money.

Professor OWEN WILLIAMS (Edinburgh) said that of the ox tribe the cow was undoubtedly the centre of infection of tuberculosis. He had pointed out some years ago that tuberculin was being used fraudulently, and he recommended then and now that tuberculin should be registered as a poison and should be sold only to practitioners who were going to make use of it for honourable purposes. He advised that local boards should be appointed for the purpose of paying compensation money promptly.

Mr. MONTEFIORE (Belgium) said that a great deal depended on the quality of the tuberculin, which was not always perfect. He recommended the use of goat's milk for tuberculous patients. In a sanatorium these animals might be kept with a great saving of expense by the authorities. They had found in Belgium that it was almost impossible to inoculate tuberculosis in goats. The odour of goat's milk prejudiced people against it, but this could be easily got rid of.

Professor J. WORTLEY AXE (British Dairy Farmers' Association) said that before the words of so eminent a man as Professor Koch went out to the world his statement ought to be scientifically proved and demonstrated. If they were to mitigate the prevalence of the disease they must observe more the laws of nature and permit the animals to live out of doors instead of in overheated byres. Of course the milk-supply was a great objection, as it would undoubtedly be much less, but the gain would be more than equivalent in the health of the animals.

Professor BANG said that for the past three years they had had a law in Denmark by which all cows with udder disease were ordered to be killed. Great care was taken in the detection of the disease. With such a law in existence it was necessary to have scientific stations where the samples of milk could be properly examined. If necessary, in a doubtful case especially, more than one sample should be examined and these at intervals sufficiently long, the milk in the meantime of the doubtful cow being boiled before being sold. He referred to the frequency of the existence of tubercle bacilli in tuberculous cows which had no disease of the udder. He thought that it was best for the cows to be out in the air for the whole year.

Mr. E. G. EASTON (London County Council) said that an examination of the cows in London ordered by the London County Council showed that only half per cent. was found to be suffering from tuberculous udders and that number was greatly decreasing. He had grave doubts, seeing that people connected with cows were the healthiest people, of the communicability of the disease from an animal to man. Cows in proper sheds could be kept in a perfectly healthy condition and there was no need for them to live in the open air all the year, to say nothing of the fact that the climate was too severe in the winter. The boiling of milk was absurd.

Professor MCFADYEAN maintained that the appearance of emaciated tuberculous cows at the markets was far too common a sight. It could never be absolutely demonstrated that it was impossible to transmit the disease from animal to man because the latter would not submit to it, and that was the only way in which it could be absolutely proved. In spite of this there was ample reason why they should concern themselves with the milk-supply and its control. He thought that Mr. Easton had misunderstood what Professor Koch had said and referred him to the latter's paper which he quoted. Mr. Easton had confused the transmissibility of bovine tuberculosis to man with the transmission of human tuberculosis to bovines.

Mr. CROWHURST referred to the importance of a pure water-supply to the cows and of good surface drainage to the sheds. Cows could not make pure milk from impure water.

Professor DEWAR insisted on the necessity of further legislation in connexion with the milk trade. At present by an extension of the Dairy and Cowsheds Act inspectors could put out of the shed such cows as were affected with tuberculous udders, but that was all that could be done.

Professor CROOKSHANK did not consider that the statement he had made some years ago had been in the least altered by the words of Professor Koch. Professor Koch had based his conclusion on the negative results obtained upon inoculation of the cattle with bacilli from the human being. He himself had in his experiments proved to his entire satisfaction that it was possible to infect an animal by transmission from man. It was impossible to prove the reverse and, therefore, he took the position that there may be danger in tuberculous milk and meat, and therefore they ought not to slacken their efforts to get rid of all such risk.

Mr. CARLE and others also spoke, and Mr. DOLLAR replied.

THURSDAY, JULY 25TH.

Mr. JAMES KING, Veterinary Inspector, City of London, read a paper on

Tuberculosis and the Meat Supply.

He said: On being asked by your secretary to open this discussion on Tuberculosis and the Meat Supply, I must say that at first I felt very reluctant to undertake it, my opinion being that it might have been placed in more able hands. However, having exceptional opportunities of making post-mortem examinations on our food animals, after duly considering the matter, I acceded to his request, in the hope that by so doing I might be able to give this Congress an idea of the prevalence of the disease and the enormous loss to the country through its ravages. The subject that we have met to discuss to-day is one of great moment, not only to the meat-trader but also to the profession generally. Tuberculosis is the cause of great loss and dissatisfaction to the farmer and also to the meat-trader; so much so that many of the latter, after endeavouring to the utmost to follow the trade of their ancestors, and to deal only in home-fed meat, have found themselves compelled, through losses arising from disease amongst their cattle, to abandon it. The cases are rendered the more trying since neither expert nor trader can by ordinary inspection detect the malady in open market. Inspection is now becoming more general, and better trained and more qualified officers are appointed than was the case formerly. The Health Acts, too, are more stringent for the protection of the public. The butcher therefore concludes that as there is no Act to protect him and as the passing of an animal by a veterinary inspector in an open market is no guarantee that what he purchased at a good price as sound and fit for human food will turn out to be so, or that money value will be realised, what is considered in his case as a trade risk is much too great, and he therefore finds it necessary to protect himself by leaving live cattle alone and to obtain his supplies from the dead-meat markets. Here he can select what suits his trade, without fear of confiscation and prosecution by reason of tuberculosis. In our dead-meat markets the home-fed meat has to compete with the foreign, which may be home-killed or otherwise, and if the supply of the former be limited or the price not suitable, the butcher is tempted to purchase the latter, and invariably finds that he can do so to advantage. The quality may be only slightly inferior or possibly equal to that for which he had been accustomed to take so much trouble and to run so much risk. He consequently continues to purchase the foreign and his customers become educated to its flavour. Thus, to the great detriment of our home supply, he may be able to furnish them with apparently as good a joint at less cost, for once the price of meat has been reduced it is difficult to raise it again. This seriously affects the farmer and the tradesman, for in the first instance the home animal has to be raised and fed at considerably greater expense than its foreign competitor, and the butcher, in addition to the risk of losing the carcass through its being a subject to tuberculosis, finds it harder still to make his purchase at a rate which will protect him from serious loss. He knows from experience that no matter what class or breed he may buy the risks are identical. His ox may cost £30, and yet after slaughter, not infrequently, the carcass is found to be so extensively pervaded with tuberculosis as to render it unfit for human food, and it therefore has to be condemned. It is common knowledge that a very large percentage of cattle in our best herds are subjects of the disease and further that it is impossible by ordinary examination to find any clinical evidence of the malady. I have had occasion to make post-mortem examinations of some of the best cattle our country produced, which were exhibited as such at our principal shows. After slaughter it has been absolutely necessary to condemn parts of them on account of tuberculosis. This has been a well-known fact for many years past and yet nothing of any consequence has been done to check the prevalence of this scourge, although it is generally admitted to be one of the sources of infection to human beings and the means of mitigating the evil are placed in our hands. A few stock-holders capable of affording it have made voluntary attempts to remedy the state of things, but their small efforts, although demonstrating what might be done if powers were granted by Act of Parliament, do nothing to check effectually the ravages of the disease or to restore the lost confidence of our meat-traders. To these agriculturists must look, for unless they can find purchasers for their cattle at remunerative prices it is of no use for them to rear and to feed stock. I have been a veterinary inspector now for over 10 years and for six of them I had the supervision of a large provincial meat market. From careful observation I have come to the conclusion that there is a growing demand for foreign meat and a corresponding decrease as regards home-fed. The reason given by the salesman is invariably that the loss is so great, through having the carcasses of home-fed cattle they buy condemned on account of their being affected with tuberculosis, that they are driven to the purchase of the foreign. Surely, this being the case, it points to the necessity for some action being taken by the Government. To realise the extent to which some of our cattle suffer from this disease it is necessary to be present when they are slaughtered. Sights are then seen which make one wonder how, large as the death-roll is from this cause, the disease

is not more prevalent in human beings, and the urgent need for proper and systematic inspection under definite laws relating both to live animals and carcasses, together with State aid by way of compensation, is obvious. With the object of ascertaining as near as possible the percentage of cattle affected with tuberculosis, the loss to the country, and the quantity of meat rendered valueless to all concerned in the matter I have made searching post-mortem examinations as follows:—

TABLE I.—RESULT OF THE POST-MORTEM EXAMINATION OF 1738 ANIMALS, CONSISTING OF COWS, BULLS, OXEN, HEIFERS, AND CALVES.

—	Cows.	Per cent.	Bulls.	Per cent.	Oxen.	Per cent.	Heifers.	Per cent.	Calves.	Per cent.	Total.
Number of carcasses and organs examined	500	—	113	—	131	—	53	—	941	—	1738
Number of carcasses free from disease	266	53·2	93	82·3	116	88·55	42	79·24	909	96·72	—
Number of carcasses tuberculous...	234	46·8	20	17·7	15	11·45	11	20·75	12	1·27	292
Number of carcasses with lesions in abdominal and thoracic regions	129	25·8	9	7·96	9	6·87	8	15·09	—	—	155
Number of carcasses with lesions in thoracic region only	87	17·4	7	6·19	3	2·29	3	5·09	—	—	100
Number of carcasses with lesions in abdominal region only	18	3·6	4	3·0	3	2·29	—	—	—	—	25
Number of carcasses with lesions in mammary glands	11	2·2	—	—	—	—	—	—	—	—	11
Number of carcasses with lesions in testicles	—	—	1	0·87	—	—	—	—	—	—	1
Number of carcasses affected...	67	13·4	5	4·42	6	4·58	5	9·43	5	0·53	88
Number of carcasses totally destroyed	35	7·0	3	2·66	1	0·76	1	1·88	2	0·21	42
Number of carcasses partially destroyed	32	6·4	2	1·77	5	3·81	4	7·54	3	0·21	46

NOTE.—All percentages calculated on the number of carcasses examined.

TABLE II.—WEIGHT AND VALUE OF MEAT AND VISCERA DESTROYED.

—	Weight of meat in pounds.	Price per pound.	—	Number of whole viscera destroyed.	Price each.	—	Number of abdominal organs destroyed.	Price each.	—	Number of thoracic organs destroyed.	Price each.	—	Total Value.
		d.	£ s. d.		s. d.	£ s. d.		s. d.	£ s. d.		s. d.	£ s. d.	£ s. d.
Cows ...	16,832	4	280 10 8	129	16 6	106 8 6	18	14 0	12 12 0	87	2 6	10 17 6	410 8 8
Bulls ...	2,376	4½	44 11 0	9	16 6	7 8 6	4	14 0	2 16 0	7	2 6	0 17 6	55 13 0
Oxen ...	1,152	5½	26 8 0	9	16 6	7 8 6	3	14 0	2 2 0	3	2 6	0 7 6	36 6 0
Heifers ...	748	5½	17 2 10	8	16 6	6 12 0	—	—	—	3	2 6	0 7 6	24 2 4
Calves ...	480	4½	9 0 0	2	5 6	0 11 0	10	2 6	1 5 0	2	3 6	0 7 0	11 3 0
Total ...	21,588	—	377 12 6	157	—	128 8 6	35	—	18 15 0	102	—	12 17 0	537 13 0

The above condemnations have been made in accordance with the recommendation of the Royal Commission on Tuberculosis. What the loss would amount to if the carcasses of all animals affected with the disease were destroyed, as is recommended by some authorities, I must leave you to conjecture. With reference to the above tables I have taken great care to see that all the meat condemned was weighed, with the exception of the calves, and the figures enumerated are taken from average wholesale prices in the trade. In estimating the prices of viscera I have taken the figures from wholesale prices given by offal contractors, *plus* the price of fat, averaging four stones per beast at 1*s.* 6*d.* per stone. This is always destroyed with the viscera in cases of tuberculosis. The figures in the table relating to calves were obtained from Mr. W. F. Shaw, F.R.C.V.S., who made the post-mortem examinations on behalf of the Local Government Board, in order to ascertain their freedom from tuberculosis. The whole of the carcasses were inspected by me, and although a record of those affected with the disease was kept their weight was not taken. I have therefore simply given an ordinary average weight. In addition to the loss sustained, as set out in Table II., to form a proper estimate of the cost of this disease to the country, it will be necessary to include the amounts paid by local authorities for destroying such affected meat and offal, in order to comply with the Public Health Acts. These statistics would be very difficult to obtain, but would, I may mention in passing, total up to no small amount. Taking figures from the annual returns of the Board of Agriculture for Great Britain under the Diseases of Animals Acts for the year 1899, which are the last supplied to me, I find that the estimated number of cows in Great Britain was 2,670,260, and taking the average life of a cow at seven years, it may be argued that one-seventh of that number is killed annually—viz., about 381,608. Therefore, if from the above table the percentage of those so affected with the disease as to render the carcasses, &c., partially or totally unfit for human food be taken, we find by the simple rule of three that if a loss on 500 cows be £410 8*s.* 8*d.* the annual loss on cows will amount to £305,067. For the purposes of this paper let us now take the numbers from the same returns under the heading of 'Other cattle aged two years and upwards.' This will include bulls, oxen, and heifers referred to in my table, as those were over that age. The number given by the Board of Agriculture is 1,341,310, and calculating the average life of that class to be three years, one may estimate that one-third of that number is slaughtered annually—viz., 447,103. Therefore, by taking the percentage of those affected with the disease, as shown by the table, we find by the same deduction that if a loss on 297 be £116 1*s.* 4*d.*, the annual loss on cattle under this heading will amount to £174,726, making a total annual loss through this disease of £479,793. It is not necessary to take the loss in calves, as the percentage of disease amongst that class is so small that it may be looked upon in the ordinary course as a trade risk and need hardly have any effect upon our meat-supply. Can it be wondered from the foregoing figures (although approximate) that the trade in foreign meat has made such enormous strides within the last few years? If we refer to the agricultural returns of the Board of Agriculture for 1900 we find that under the head of fresh meat imports it is reported that a quota which formed only one-fifth of a single pound per unit of the population in 1866-1870 has expanded to little short of 20 pounds per head on the average of the five years 1896-1900, and has touched 22·5 pounds per person in the single year 1900, an instance of progress quite out of all proportion to the development of other forms of imported food. On again looking at the returns of the total number of cattle

in this country for the last ten years, we find that the year 1900 shows a decrease, as compared with the year 1891, of 47,821. These figures denote that although our population is steadily increasing, as are also our meat-eating propensities, nothing is being done to supply the increased demand, with home-fed cattle. In our live-stock markets at present, although returns show that supplies are not so plentiful as in previous years, there seems a difficulty in salesmen realising profitable prices for beef cattle. In conclusion, I am convinced from personal observation that the principal cause for this state of things is tuberculosis, and we are not improving it by our present voluntary efforts to purify some of our stock by the use of tuberculin, as this undoubtedly throws a much larger number of known tuberculous animals on the market and increases the risks of the butcher, thus making the purchase of home animals more of a gamble than a legitimate trade. Is it then surprising that he purchases foreign meat to supply his customers instead of the home article? I have endeavoured to place before you in these few remarks as clearly as I can in the time allowed the present state of affairs, which has now been going on for years, and there can be little doubt that the cause is on the increase. I cannot conclude without asking how long will this be allowed to continue in our midst before any active steps are taken to eradicate, or even to reduce, the prevalence of this disease."

THE SOCIAL SIDE.

Sir James Blyth, the honorary treasurer of the Congress, entertained to dinner at 33, Portland-place, on Monday, July 22nd, the Duke of Cambridge who had presided on the afternoon of that day at the opening ceremony of the Congress. Sir James Blyth invited to meet his Royal Highness the President and members of the Organising Council of the Congress, many of the various officers of the different sections, the foreign delegates of the Congress, and a group of distinguished members, British and foreign, as well as Prince Edward of Saxe-Weimar, the Duke of Northumberland, Earl Cadogan, the Earl of Derby, Lord Strathcona and Mount Royal, and the Lord Mayor of London. Covers were laid for about 60.

On the same evening the members and delegates of the British Congress on Tuberculosis were entertained at the Queen's Hall, Langham-place, by the President of the Council of the Congress and the executive officers. The great hall was tastefully decorated with flowers and palms and the Royal Engineers string band played during the evening a varied selection of music. There was a very numerous assembly of guests and the music was in consequence drowned by the buzz of conversation. In St. George's Hall, which adjoins the Queen's Hall, Professor G. Sims Woodhead, of the University of Cambridge, gave a bacteriological demonstration illustrated with lantern slides. His audience would probably have been larger if some means had been devised of informing the guests the way to the lecture-hall. This same want of organisation also led to much disappointment among those who were desirous of hearing Professor McFadyean of the Royal Veterinary College deliver a discourse in the same hall. An interesting event in the evening was an impromptu demonstration by Professor Koch of specimens and cultures in the Congress museum at the top of the building, and those who by dint of much questioning did find their way there were well rewarded for their trouble.

On Tuesday afternoon the members of the Congress were invited to an At Home at Apsley House on the invitation of the Duchess of Wellington. The gathering was a great success and the magnificent pictures were thoroughly admired.

On Tuesday evening the delegates and members of the British Congress on Tuberculosis were received at the Mansion House by the Lord Mayor and Lady Mayoress. The spacious reception rooms were crowded—over-crowded, in fact—with guests of all nationalities. Herr Wurm's string band was delightful.

On Wednesday afternoon the ladies of the Reception Committee entertained the delegates and members of the British Congress on Tuberculosis at a garden party in the Royal Botanica Gardens, Regent's Park. The band of the 2nd Life Guards played selections during the afternoon, as did also the Blue Hungarian Band, and Clifford Essex's Pierrots gave one of their well-known entertainments. The rain fortunately held off, though the sky was threatening.

Professor R. Koch was entertained to dinner at the Hôtel Métropole on Wednesday evening by the Royal Institute of Public Health, the occasion being taken of presenting to the guest of the evening the Harben Gold Medal for 1900. Professor Koch replied in German to the toast of his health, proposed by Dr. W. R Smith, the President of the Institute. He said that he was happy to remember that the first to recognise his work in anthrax were his English colleagues.

Sir James Crichton Browne, in the course of a reply to the toast of "The Tuberculosis Congress," remarked that there would have to be an inquiry by Government into the question of tuberculous infection from animal to man to settle the accuracy of Professor Koch's views. If a Government Commission were formed he had been authorised by Sir James Blyth to offer that gentleman's model farm in Essex for the investigation.

COMPLIMENTARY DINNER TO SURGEON-GENERAL J. JAMESON, C.B.

IN the Grand Hall of the Hotel Cecil, on July 24th, a complimentary dinner was given to Surgeon-General J. Jameson, C.B., when Sir William Church, Bart. (President of the Royal College of Physicians of London), presided. Covers were laid for some 160 hosts of Surgeon-General Jameson, and the gathering was a very representative one.

After the Royal toasts had been duly honoured,

The CHAIRMAN proposed "Our Guest." He said that they had met from a desire to do honour to one who had deserved well both of his profession and of his country. Surgeon-General Jameson had had an active and varied life and entered the Army Medical Service so long ago as 1857. He attained distinction in the part he took in repelling the Fenian raiders in Canada and subsequently was engaged in fighting a severe epidemic of "yellow jack" in Trinidad. For these services he received promotion and special thanks. He had also done splendid work in the Franco-German war and had served his country well in various parts of the empire. In 1896 he was appointed Director-General of the Army Medical Department. The present war, which they had good hopes was now coming to a close, was a perfectly unique war, unprecedented in its character and difficulties. Never before had they had to meet such a foe. The labours and difficulties which the Director-General had had to surmount in this connexion were enormous, and he had practically been in the position of the Israelites of old, who had to make bricks without straw. The actual organisation of the hospital service had to be done in South Africa, and its success was in a large measure due to the rapidity and continuity with which Surgeon-General Jameson was able to supply the *matériel* and *personnel*. A few weeks ago Surgeon-General Jameson in that room told them of the requirements that had been made upon him and that he had been able to meet them. That was strictly accurate, and the highest possible credit was due to him and to his department. They all recognised the value of his long life spent in the service of the country, and still more the constancy with which he stuck to his post and his work. They also wished to acknowledge the exceedingly able manner in which he kept up a good relationship between his own corps and their civilian brethren. They wished him long life and strength that he might long enjoy the leisure which now had befallen him.

Surgeon-General JAMESON said that he felt some difficulty in replying to the toast and adequately expressing his feelings of profound gratitude to the medical profession for the compliment which they had paid to him and through him to the Royal Army Medical Corps. It had been his fortune to be director-general through a very eventful period when a strain had been put upon his department such as it never had to bear before. In the early months of the war the whole of the establishment was expended and events developed so rapidly that the army was first doubled and then increased threefold. With every unit that embarked medical *matériel* and *personnel* had to be provided and the demands were made upon a department which was already impoverished. Up to the present time they had received 50,000 invalids from South Africa, India, and the colonies since the beginning of the war. They were all received and handled by his department, and he was ably assisted by the

quartermaster-general's department. None of the patients were transferred to a civil hospital, and only those who were sick while on furlough gained access to civil hospitals. From the first to the last the work was done without a single hitch. His critics had asked how all this could be done and he would tell them how the "miracle" had been performed. First of all the Army Medical Reserve were called out and wherever possible men were enlisted and trained for the work. Then every man that could be spared from colonial stations was employed and he had been enabled to send out nearly 7000 trained men. The Militia Medical Staff Corps was also called upon and supplied 500 men, while the volunteers furnished 600 men. Pensioners were also invited to return to the colours and the invitation was well responded to. Outside his own corps the most useful was the St. John Ambulance Brigade, which gave them 1900 men, who for the most part had had no previous hospital training, but who soon made very efficient nurses. There was some difficulty in getting trained men at the beginning of the war but that was not the fault of the director-general or of the officers associated with him. They had for a considerable time urged the necessity of increasing the *personnel* but for the most part without avail. Then female nurses were employed and 800 were sent out. It was to the Queen and to the Princess Christian that they were indebted for being able to send out so many female nurses. The scheme arranged in time of peace with the Commander-in-chief did not include female nurses, and hence they were not sent out earlier in the war. The army nursing reserves had been of the greatest advantage and the nurses whom the Princess Christian had selected had rendered most efficient services even at the sacrifice of their lives, and the failures can be counted on the fingers of one hand. As professional men and taxpayers they might be interested to know something of what was done with regard to medicine and *matériel*. The medical vote was, in round numbers, £300,000, but £1,000,000 had been spent. The amount of this *matériel* sent to South Africa was 4000 tons. 151 staff and regimental units had been mobilised, 19 bearer companies formed, 28 field hospitals, five stationary hospitals, and 16 general hospitals had been prepared, as well as three advance and two base depôts for medicines. In this country two hospital ships were equipped and three hospital trains. Men and *matériel* were also sent out to enable the principal medical officer to organise many more units in South Africa. At the same time a large quantity of *matériel* had to be sent out for the China field force. From a recent report it was shown that at the present time there were 21,000 beds equipped, not counting the provision made for field hospitals. The private hospitals organised in this country were of the greatest service, and the country owed those who equipped them a deep debt of gratitude. He would point out to his critics that with regard to supply the medical department was only responsible for medicine and medical and surgical appliances. Food and so-called medical comforts were supplied on requisition to the Army Service Corps. Blame should be apportioned, therefore, to those who were in fault. With respect to ambulance arrangements, in view of the fact that the post of sanitary officer had been abolished against the advice of the medical department blame should be laid elsewhere than at the door of the Army Medical Department. As to the selection of sites for hospitals in camps that was the duty of the Royal Engineers or of the Barrack Department, but, as far as he was aware, those departments had not carried out that duty and the medical department had to undertake the alteration of buildings for hospitals at a time when every officer should have been employed in his own legitimate work. If in the future war was to be carried on on humanitarian principles it would be necessary for the medical department to obtain a large increase of transport. He had received many flattering reports from general officers of the work that had been done, but the medical department was not on an equality with the other departments. The Director-General was not a member of the War Office council over which the Secretary of State presided, or of the Army Board presided over by the Commander-in-chief, and it had happened that matters relating to his department had been discussed in his absence and he had not known of the decisions till after considerable delay. During the war no general had done better than Sir Redvers Buller, and he had spoken in high praise of the work of the medical department. Taking everything into consideration he was sure that in no war had the sick and wounded been so well looked after as they had been in the present one. When the history of the war was written he was convinced that that would be the verdict.

Sir WILLIAM MACCORMAC, Bart., K.C.B., in proposing the toast "The Public Medical Services," said it was an unfortunate state of things, if he had been rightly informed, that at the present time there was not a single candidate applying for admission to His Majesty's medical service. In the work of the Medical Department in South Africa they had had some things to criticise, but many things to commend, and he was surprised that there were not more things with which to find fault. They had heard from the Director-General how his department had overcome the difficulties, and they had not only done their best, but that best had been extremely good. No one who had not been in the country itself could know of the difficulties under which the medical department had laboured. They had been blamed for that for which those in other departments were responsible, and it was somewhat strange that the Government had allowed Surgeon-General Jameson to leave the army without the customary recognition given to every one of his predecessors and without one word of thanks or acknowledgment.

Sir JOSEPH FAYRER, Bart., K.C.S.I., responded, and the toast of "The Chairman" proposed by Sir THOMAS GALLWEY, K.C.M.G., and briefly acknowledged by Sir WILLIAM CHURCH, brought to a close a very successful and notable evening.

BIRMINGHAM.

(FROM OUR OWN CORRESPONDENT.)

The University of Birmingham.

THE first graduation ceremony of the new University was held in the Town Hall on July 7th. The Chancellor, the Right Hon. Joseph Chamberlain, took his place surrounded by a large array of graduates in full academic costume. A procession was formed from Mason College, the present seat of the University, to the Town Hall, where amid much enthusiasm the degree congregation was held. The students took a prominent part on the occasion, enlivening the proceedings by songs, observations on the candidates, and the exhibition of humour licensed for the time being. Mr. Chamberlain delivered an important speech on the attributes of an ideal university and laid down definite requirements to insure its success. An appeal for more funds accompanied the views that he expressed and he hoped that the lines laid down for future progress would be realised to the full extent. The proposal previously made that a rate should be levied for the University at one halfpenny in the pound was assented to at a subsequent meeting of the Town Council; this opens a fresh source of steady income which it is estimated will bring in £5000 a year—a valuable addition to the funds of the University. This has been adopted on the precedent of other towns and represents a certain income outside the voluntary efforts which have been so generously made by a large number of donors.

Birmingham and Midland Eye Hospital.

The annual meeting of the friends and supporters of this institution was held on July 15th, the seventy-first report being read. The subscriptions for the year amounted to £3961, an increase of £245 as compared with the previous year. The total number of patients treated were: in-patients, 1093; out-patients, 25,572. The medical report showed that 774 operations had been performed on in-patients, including 327 for the removal of cataract in its various forms, and of these only four proved unsuccessful. The operations necessitated the administration of anæsthetics in 194 cases. One patient died from the effects of chloroform, an accident which had not previously occurred in the hospital for 28 years. One difficulty had been experienced by the committee, that of obtaining a resident house surgeon—a circumstance attributed to the war in South Africa demanding the help of members of this class of the profession. The usual votes of thanks were passed.

Death under Chloroform.

A death under chloroform recently occurred at the Hospital for Women. The patient, aged 53 years, was undergoing an operation for cancer. Chloroform and ether were given. Professor J. T. J. Morrison found signs of pleurisy and

said that the muscles of the heart were thin and of poor tone. "Death from misadventure" was the verdict returned.
July 23rd.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

Proposed West African Health and Sanitation Commission; Major Ronald Ross, F.R.S., late I.M.S., at Freetown.

MR. ALFRED L. JONES presided on July 10th over a representative conference convened by the African trade section of the Liverpool Chamber of Commerce to consider the arrangements for carrying into effect the proposals of the Secretary of State for the Colonies, whether it should be recommended that the proposed West African health and sanitation commission should be appointed to proceed to each of the colonies separately or whether one commission should be appointed to proceed to the whole of the colonies. The following gentlemen were nominated to represent the commercial interests of the three chambers concerned:—viz., Mr. C. Tambacci for Liverpool, Mr. Thomas Welsh for Manchester, and Mr. J. H. Batty for London. The month of October was suggested as a suitable time for the commission to leave England. The nomination of a scientific expert, which had been suggested by Mr. Chamberlain was next considered and it was unanimously agreed to nominate Major Ronald Ross, F.R.S., late I.M.S., to the post. It was also suggested that a sanitary engineer should be appointed, and it was resolved that this suggestion should be communicated to Mr. Chamberlain who should be asked to consent to this addition to the commission.—A telegram was received on July 19th by the honorary secretary of the Liverpool School of Tropical Medicine from Major Ross, Freetown, Sierra Leone, to the effect that an active general crusade had been commenced by the expedition against mosquitoes at Freetown and that the progress was very rapid. Major Ross was employing 30 native assistants and would shortly depart for Lagos. Major Ross gave a lecture on the "Malarial Mosquito" at Freetown on July 18th. The hall was crowded and much enthusiasm was displayed.—At a meeting of the School of Tropical Medicine, held on July 22nd, a letter was read from Major Ross stating that before any practical anti-mosquito measures could be taken at Bathurst, Gambier, it would be necessary to make careful inquiries there to ascertain the source of the mosquitoes, the danger of malaria among native children, and the most feasible steps for dealing with the insects. He therefore recommended that someone should be sent out for this purpose. The school unanimously resolved to adopt Major Ross's advice and arrangements are now being made for the despatch of another expedition to West Africa, making in all the seventh sent out by this enterprising school.

Death of the Medical Officer of Health of Warrington.

The death of Mr. J. H. Gornall, the medical officer of health of the borough of Warrington, took place on July 18th after a somewhat prolonged illness. The deceased was a native of Preston and was 59 years of age. In 1857 he was apprenticed to his uncle, the late Mr. Kenyon of Wavertree, and four years later he entered as a student at the school of medicine of the Liverpool Royal Infirmary. He obtained the Membership of the Royal College of Surgeons of England and the L.S.A. in 1864. He retired from private practice in 1880 upon his appointment as medical officer of health of Warrington. He also held the posts of public analyst and medical superintendent of the Warrington Fever Hospital and was appointed a justice of the peace in 1885. The late Mr. Gornall was universally esteemed. His eldest son, Dr. J. G. Gornall, was recently appointed deputy medical officer of health of the borough of Warrington.

Distribution of the Hospital Saturday and Sunday Fund.

The committee of the Hospital Saturday and Sunday Fund have allocated £13,365 among the various hospitals of the city. This is the largest amount ever distributed in the history of the Fund. The Royal Infirmary received £2943, the Royal Southern Hospital £2010, the David Lewis Northern Hospital £1742, and the Stanley Hospital £1138. Other charities received contributions in proportion to the number of beds available.

Cricket Match between Manchester and Liverpool Medical Men.

On July 16th the annual cricket match between Liverpool and Manchester medical men took place at Aigburth, in glorious summer weather, in the presence of a fashionable company. Liverpool came off victorious.
July 23rd.

WALES AND WESTERN COUNTIES.

(FROM OUR OWN CORRESPONDENTS.)

Important Defence in a Meat Prosecution.

A BUTCHER was charged at the Swansea police-court on July 9th with having in his possession a forequarter of beef which was unfit for the food of man. The meat had been seized by the meat inspector who is a qualified veterinary surgeon, and the defendant's solicitor at the commencement of the hearing claimed that the medical officer of health and the inspector of nuisances were alone competent to make the seizure. The presiding magistrate upheld this contention, but consented to hear the case and if desired to state a case for a superior court. The proceedings occupied the greater portion of two days and on July 18th a fine of £2 with costs amounting to £20 5s. was imposed. In giving his decision the magistrate stated that he now thought that it was competent for the meat inspector to make the seizure. An appeal to quarter sessions will probably be made.

Gynæcologist to Cardiff Infirmary.

Dr. Ewen John MacLean was on July 17th elected gynæcologist to the Cardiff Infirmary in succession to the late Dr. John D. Williams. There were six candidates for the appointment, three of whom were medical practitioners residing in Cardiff.

A Prescribing Druggist Fined.

A druggist named Jenkins was fined £20 at the Carmarthen county court on July 18th for practising as an apothecary without having a licence of the Society of Apothecaries. In the course of the proceedings the coroner for West Carmarthenshire stated that Jenkins had appeared before him on four different occasions when inquests had been held upon persons who had been prescribed for by the defendant. The defence raised was that the medicine was alone charged for and not the advice.

Swansea Convalescent Home.

The anonymous donor of £500 towards the erection of a convalescent home in connexion with the Swansea Hospital and who, as stated in THE LANCET of July 20th, p. 174, had raised the amount to £5000, has still further increased it to £10,000. The building, which it is estimated will cost £12,000, will be proceeded with at once.

Outbreak of Diphtheria at Keynsham.

Early in July an outbreak of diphtheria occurred at Keynsham, a rural district with a population at the last census of 8266 persons, adjoining Bristol. In a report to the district council, Mr. J. C. Heaven, the medical officer of health, states that upon visiting the school which was attended by the child who was first attacked he saw 12 pupils apparently quite well, but who were found, after bacteriological examination of material taken from their throats had been made, to be suffering from the disease. Altogether 29 persons were attacked, of whom 16 were removed to the isolation hospital.
July 23rd.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Hughes Bennett Laboratory of Physiology at Edinburgh.

ON July 20th the new physiological laboratory which has been built by Mrs. Cox, widow of the late Mr. Robert Cox, M.P., of Gorgie, in memory of her father, Professor Hughes Bennett of Edinburgh University, was opened and formally handed over to the university authorities by the donor. The inaugural ceremony took place in the new laboratory, Principal Sir William Muir presiding. There was a large gathering of ladies and gentlemen, including members of the professoriate and university bodies and many eminent physiologists from various parts of the kingdom. After apologies for absence had been read by Professor E. A. Schäfer, Mrs. Cox, in handing over the laboratory, addressed the Vice-Chancellor as follows—"I ask you, on behalf of the

university, to accept this laboratory which I have built to the memory of my dear father and to help physiological research in the university." Sir William Muir thanked Mrs. Cox in the name of the university for the great work which she had done for the university in building the new laboratory and in dedicating it to the memory of her father, Professor Hughes Bennett. Mrs. Cox then unveiled a bronze bas-relief representation of her father which is fixed to the south wall of the largest room in the laboratory. Sir John Burdon Sanderson, Bart., F.R.S., Regius Professor of Medicine in the University of Oxford, then expressed on behalf of the students of Professor Hughes Bennett who were present their high appreciation of the exactitude of the likeness which the sculptor, Mr. Macgillivray, had given them. The bronze panel presents the figure in half-length with the face three-quarters to the left. The figure is seated, the left arm lying on the arm of a chair. The inscription below it runs as follows:—"John Hughes Bennett, M.D., F.R.S.E., Professor of the Institutes of Medicine and of Clinical Medicine in the University of Edinburgh. The first in this country to teach the use of the microscope in the clinical investigation of disease. This laboratory was erected as a memorial by his daughter in 1901." The company then adjourned to the McEwan Hall, where Sir John Burdon Sanderson delivered an address on the life and work of Professor Hughes Bennett. In this address Sir John Burdon Sanderson in the first place gave a sketch of Professor Hughes Bennett's career as a student. He then described his work as an extra-academical teacher and as a professor, and spoke of the influence which he exerted on the men who began their training as practitioners under him, referring finally to the special service which he had rendered to the science of medicine in this country in combating the use of anti-phlogistics and bleeding in acute disease. Professor J. G. McKendrick proposed a vote of thanks to Sir John Burdon Sanderson, which was seconded by Sir John Batty Tuke, M.P. Sir William Muir, in closing the proceedings, again expressed the indebtedness of the university to Mrs. Cox for her munificence. The laboratory is in direct connexion with the existing laboratories. It consists of a large laboratory for practical work by individual students and a small theatre intended specially for demonstrations of experiments by the professor. This theatre will accommodate from 90 to 100 students. It will have an electric lantern. Part of the large laboratory has been partitioned off to provide, in the meantime, a room for microscopic demonstrations.

July 23rd.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Sanitary Condition of Whitehouse.

DR. C. J. CLIBBORN, Local Government Board medical inspector, reports in reference to the Whitehouse districts in the neighbourhood of Belfast that there is no regular inspection of the meat- and milk-supplies and that the sewerage of Upper and Lower Whitehouse is not sufficient or satisfactory. Typhoid fever has been prevalent in the Upper Whitehouse district, and although the subject of the sewerage of Upper Whitehouse has been under consideration for years nothing has been done. It is to be hoped, the inspector writes, that the district council will without further delay perform this necessary work. The Infectious Diseases (Notification and Prevention) Acts have not been adopted, and it is recommended that the district council should adopt both these Acts.

North of Ireland Branch of the British Medical Association.

The twenty-third annual meeting of the members of the North of Ireland Branch of the British Medical Association was held in the Museum, Belfast, on July 18th, the President, Professor J. W. Byers, being in the chair. After the minutes had been read the annual report and statement of accounts were submitted and passed. There are now over 300 members and the branch is the largest in Ireland. The work during the past year was excellent and there is now a balance in hand of over £20. Dr. J. S. Darling (Lurgan) was elected president for the ensuing year, Dr. John Campbell and Dr. D. P. Gaussen were chosen as vice-presidents, Dr. George Gray (Newcastle) was elected treasurer, and Dr. W. Calwell secretary. Professor Byers and Dr. Calwell were elected representatives of the branch on the central council of the British Medical Association and Dr. Alexander Dempsey was elected on the Parliamentary Bills Committee. The following scientific work was then brought before the meeting. Dr. T. S. Kirk read notes of a case of Suppurative Nephritis treated by Nephrotomy and showed two cases of Excision of the Hip; Dr. A. B. Mitchell gave a lantern demonstration illustrative of the Conditions Found and Different Operations carried out in a Series of 18 Operations on the Stomach; Dr. C. E. Shaw gave brief notes of the removal of an Ivory Exostosis from the Auditory Meatus; Professor W. Whitla showed a specimen of a Dissecting Aneurysm; Dr. R. J. Johnstone showed specimens of Charcot's Joint Disease, Endothelioma of the Ovary, Sarcoma of the Ovary invading the Myoma of the Uterus, and Healed Typhoid and Dysenteric Ulcers; and Dr. Dempsey showed a Fibroid Tumour of the Uterus removed by Retro-peritoneal Hysterectomy. After the meeting Professor Byers entertained the members at luncheon in the Prince's Restaurant. The President gave the toasts of the King and the City of Belfast, to which the Lord Mayor (Sir Daniel Dixon, D.L.) responded. Mr. G. L. St. George, J.P., in a very happy manner proposed the health of the President (Professor Byers), to which that gentleman responded, and spoke of the great services rendered to the branch by the very efficient secretary, Dr. Calwell, who, most unwillingly, owing to an assize case, was unable to be present.

The Typhoid Fever Epidemic in Belfast.

In reply to the report issued by the Public Health Committee blaming the water-supply at Stoneyford as the cause of the outbreak of typhoid fever the Water Commissioners have promptly, through their chairman, shown that there is another side to the question. Attention is drawn to the fact that, although the defective nature of the drains in many of the houses affected in the district where the present outbreak occurred and the insanitary condition of many of the dwellings and inmates are admitted yet no importance is attached to these serious elements and vital causes of typhoid fever. The reporters visited Stoneyford in June last and being informed that two cases of typhoid fever had occurred in farmhouses as far back as Feb. 5th and 28th they concluded without further inquiry that the Stoneyford water caused the outbreak in Belfast in May and June last. The Water Commissioners reply that the houses were thoroughly disinfected and all the manure and excreta from the patients were completely removed by their employés to lands outside the catchment area and that not a drop of water from this area was admitted into the Stoneyford reservoir from Dec. 23rd, 1900, until March 21st of this year—that is, for a period of eight weeks prior to the occurrence of the typhoid fever in this area and some four or five weeks after. Further, no reference is made to the effect of the prolonged storage to which the water is subjected in the reservoirs or to the after-treatment of the water at the filters which have been found to reduce 99 per cent. of the bacteria. It is asked, further, why, if the Stoneyford water was the cause of the present outbreak, do Dunmurry and all the high levels of the city of Belfast from the Upper Falls to the Crumlin-road and Old Park-road, which are supplied by the same water, escape. The commissioners were uninformed of the visit to their catchment area of the gentlemen who drew up the report for the Public Health Committee; had they been informed of it they would have told them of the important precautions taken by them to prevent any pollution of the catchment area. In a word, this report of the Water Commissioners implies that it is the bad sanitary condition of the district where the typhoid fever first appeared which is the real cause of the epidemic and not the water, which had it been infected with typhoid germs would have caused an outbreak in the whole area supplied by it. It is satisfactory to know that last week the cases of typhoid fever had fallen to 79. It is thought that the corporation will demand a Local Government Board inquiry into the causes of the epidemic.

July 23rd.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Treatment of Puerperal Infection.

AT the meeting of the Academy of Medicine held on July 9th M. Budin gave a description of the method of

treating puerperal infection as used by him since 1892. In the normal puerperium involution of the uterus takes place quickly, so that after a few days the internal os is closed. But if the uterine mucosa has been infected the underlying muscular fibres are paralysed and there is no difficulty in passing the finger into the uterine cavity. This abnormal permeability of the uterus is of great importance from a diagnostic point of view. For thorough cleansing the patient must be deeply anæsthetised and the uterus curetted with the finger. The cavity must also be mopped out with fairly large swabs. Facts go to show that the cleansing of the interior of the uterus can be very thorough. According to M. Budin if fever supervene in a woman recently confined and clots are found in the uterus they should be removed whether stinking or not, and if this is followed by washing out the uterus possibly sufficient will have been done. If, however, the uterine mucosa is infected, especially at the placental site, digital curetting and swabbing must be carried out. Recovery is generally rapid if treatment has been entered upon at an early stage. If the infection has lasted for some days recovery is very slow, for both the germs and their toxins have entered the system. Recovery has been known to occur even in apparently desperate cases, but death sometimes supervenes. Another consequence results from these facts—i.e., should a woman be confined or should she abort, if the amniotic fluid is fœtid and some days have elapsed since the rupture of the membranes, digital curetting and swabbing should be carried out one after the other as a prophylactic measure (*nettoyage prophylactique*). At the Tarnier clinic there are some isolation beds into which women are taken who have become infected either outside the hospital or within its walls. During the last academic year, from Nov. 1st, 1900, to June 30th, 1901, 33 infected patients were admitted from outside. In four of these cases uterine injections after digital exploration resulted in recovery. In 13 cases *nettoyage prophylactique* was performed and in 16 digital curetting and swabbing were done. Only one woman succumbed who had come in from Choisy-le-Roi in a desperate condition eight days after her confinement. Of patients already in the hospital 59 became infected and were sent to the isolation wards. All recovered. The total number of cases for the term was 1137 confinements or abortions taking place in the clinic with no deaths from infection. M. Budin, while allowing that the death-rate for the term under review was exceptionally light, considers that his methods have a great deal to recommend them.

On a Micro-organism found in Syphilitic Plasma.

M. Jullien not long ago stated before the Academy of Medicine that in the blood and serum of syphilitic patients who had recently been infected and who had not undergone any specific treatment M. de Lisle and himself have confirmed the presence of round granular highly refracting bodies such as have been already described by other observers. M. Jullien and M. de Lisle have, however, been unsuccessful in cultivation and inoculation-experiments with these granules. This is not surprising, for it is well known that syphilitic blood when once coagulated is harmless, a peculiarity which may be explained by the existence in the blood after coagulation—i.e. in the serum—of an "alexine" which is strongly bactericidal. Researches have also been undertaken into the nature of the serum from a blister, whether produced by cantharides or by the actual cautery. Such serum M. Jullien and M. de Lisle found to contain no alexine whatever. They did find, however, a polymorphic organism bacillary in shape and showing all intermediate stages between that of a slender rod (from 5 μ to 8 μ in length and from 0·15 μ to 0·30 μ in breadth) and that of a long filament. The organism was mobile, staining easily with the usual reagents but not by Gram's method. It caused bouillon to become turbid in 24 hours, forming a thick growth thereon in from four to five days. It liquefied gelatine and grew well on glycerin, also on potato, amniotic fluid, gelose, and solidified serum. It would grow under anaerobic conditions but only slowly. As the age of the culture increased the appearance of the microbe altered so that after 10 days or so nothing was seen but the granules which had been originally observed in the blood of syphilitic patients. If a re-culture was made the primitive characters reappeared. After 30 days the cultures were apparently dead, but could be revived by appropriate measures. If these organisms were injected into the peritoneal cavity of a guinea-pig there resulted paralysis, wasting, abortion, and death in from 10 to 15 days. Young animals died in 12 hours. Subcutaneous inoculation brought about an indurated area which afterwards ulcerated, while the glands in the vicinity swelled up. On post-mortem examination the blood was always found to be sterile. In syphilitic patients inoculation was unsuccessful whether through an open wound or by absorption. The specificity of this pathogenic organism appears evident from two facts—firstly, it is agglutinated by the serum of patients obviously suffering from syphilis, an agglutination which does not occur with the serum of healthy patients, and secondly, the property which it possesses of being acted on by the alexine contained in the serum of animals which have been inoculated with syphilitic poison—a fact which proves the existence of specific properties.

July 23rd.

CANADA.

(FROM OUR OWN CORRESPONDENT.)

Ontario Medical Association.

THE twenty-first annual meeting of the Ontario Medical Association was held in Toronto on June 19th and 20th under the presidency of Dr. Angus McKinnon (Guelph). Dr. William Oldright, Professor of Hygiene in the University of Toronto, reported on three recent gall-stone cases; in these cases two patients were operated on successfully and an uneventful recovery was noted. The third case was found to be complicated with malignant disease on opening the abdomen. Had the patient been operated on a few years before Dr. Oldright thought that her life might have been saved. It was impossible to locate the gall-bladder in this case. Dr. Herbert A. Bruce (Toronto) showed a woman, 34 years of age, from whom he had removed the left upper jaw for sarcoma. The disease was first noticed as a swelling, slight in character, simulating a gum-boil on the alveolus of the left upper jaw. Dr. Silverthorn presented the pathological specimen and stated that it contained spindle cells with a cartilaginous basis. It was as large as a good-sized orange. A very interesting discussion took place on Ectopic Gestation which was introduced by Dr. R. W. Garrett, Professor of Medicine in Queen's University, Kingston, Ontario. He directed attention to arrest within the tube or tubal pregnancy principally, and thought that in a fairly large proportion of these cases a diagnosis ought to be made before the occurrence of rupture; every physician should be able to make the diagnosis after the occurrence of rupture. Dr. J. F. W. Ross thought that they should now be able to make these cases out before the rupture took place. At the opening of the afternoon session the President delivered the annual address. It was practical and thoughtful and dealt with the "fakes" in medicine, or rather those which hang on to the skirts of medicine. The Dowie-ites, the Christian Scientists, the electric-belt men, and the pray-for-hire healers, as well as their advertisements in the daily press and also in the religious papers were condemned most freely. Dr. McKinnon further deprecated manufacturers making up pills for neuralgia, &c. There should also be better facilities for getting the subjects of acute manin into asylums, so as to avoid irritating delays. Dr. P. H. Bryce, Secretary of the Ontario Board of Health, read a practical paper on the vaccinal protection against small-pox which, in view of the fact that this disease has been, and is still, prevalent throughout the province, evoked animated discussion. He considered that there never was a time since the introduction of vaccination when there was so much carelessness in regard to it amongst the laity as well as amongst the profession. Dean Geikie of Trinity Medical College considered Jenner's discovery to be one of the grandest and most glorious in the annals of medicine. A special committee, on the suggestion of Dr. Wishart, drew up a motion, which was subsequently passed, approving of from three to five insertions in the practice of vaccination and calling upon the profession to be more diligent in the performance of this art. Mr. I. H. Cameron warned the profession against laxity in dealing with this most important subject. Empyema was another question which evoked a very interesting discussion. In a carefully prepared paper it was introduced by Dr. R. Ferguson (London, Ontario) who

confined his remarks to the medical aspect of it. Dr. J. L. Turnbull (Goderich) dealt with the surgical side of the question, stating that it was his practice when pus was present to take out a portion of a rib about one and a half inches in length. Particular attention should always be paid to the hard fibrous tissue which was always present beneath the ribs. The Open-air Treatment of Disease was the subject of a paper by Dr. George H. Carveth (Toronto), who described his method of treating diseases, firstly in rooms with wide-open windows; secondly, on verandahs; and, thirdly, in tents on the lawns. Some of the cases which he had treated in this way were iritis, cases of fracture, cases of the radical cure of hernia, rheumatoid arthritis, tuberculous disease of the spine, typhoid fever, and a case of hysterectomy. When once accustomed to open-air life there was great difficulty in getting patients to return indoors. Dr. L. Coyteux Prevost (Ottawa) read a lengthy paper on the Use of Nitrous Oxide and Ether as an anæsthetic. The Complications and Degenerations of Fibroid Tumours of the Uterus with reference to the treatment of these growths was a subject ably dealt with by Dr. Charles Noble (Philadelphia). Dr. Arthur Mayburry (Toronto) contributed a paper on the Relation of Nasal Obstruction to Obscure Cases of Asthma; while Dr. J. T. Duncan (Toronto) read a paper on the Importance of an Early Recognition of Locomotor Ataxia. He referred chiefly to the eye symptoms as aids to an early diagnosis. Dr. D. J. Gibb Wishart spoke on the use of adrenalin which he had found very useful as a hæmostatic in many cases. He considered it to be a valuable adjunct to the medical man's armamentarium. Another important discussion took place on Gastric Ulcer. Dr. R. D. Rudolf (Toronto) opened this discussion, speaking of the relation of cancer to ulcer, the value of ergot, the question of diagnosing the site of the ulcer, and whether cases of apparently "cured" gastric ulcer are "first-class lives" for insurance. Dr. H. B. Anderson, Pathologist to Trinity Medical College, dealt with the pathological aspect lucidly, while Dr. Henry Howitt contributed an exhaustive paper on the surgical aspect. In distension it was Dr. Hewitt's practice to evacuate the bowels. One or more small incisions in the prominent coils soon overcame the distension and each one was closed before another was made. "On the Relation of Hyperacidity of the Stomach to Bilious Attacks, some Forms of Eczema, Muscular Rheumatism, and Gout," was the title of a paper contributed by Dr. Graham Chambers (Toronto) and it exhibited careful observation on the part of the writer. In the medical treatment of surgical tuberculosis Dr. W. B. Thistle (Toronto) thought that in surgical tuberculosis the medical treatment was too often neglected and that cases would do better if medical treatment were added to the surgical. Dr. Walter McKeown (Toronto) dealt with the treatment of Post-operative Peritonitis. A committee was appointed to report on the propriety of establishing a medical defence union in Ontario; and a resolution was unanimously passed upholding the action of the Ontario Medical Council in enforcing payment of the annual $2.00 assessment. The following were the officers elected: President, Dr. N. A. Powell (Toronto); first vice-president, Dr. R. Ferguson (London, Ontario); second vice-president, Dr. R. W. Garrett (Kingston); third vice-president, Dr. L. C. Prevost (Ottawa); general secretary, Dr. Harold C. Parsons (Toronto); assistant secretary, Dr. George Elliott (Toronto); treasurer, Dr. A. R. Gordon (Toronto). Toronto was selected as the next place of meeting.

Toronto, July 8th.

NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Passengers' Rights on Electric Street Cars.

ACCIDENTS due to the haste of conductors are of almost daily occurrence on street cars. However expeditious in his movements the passenger may be he is constantly ordered by the conductor to "hurry up" or to "step lively," whether he be leaving or entering a car. The cause of the accident is generally the starting of the car before the passenger is safely on or off, as the case may be. Generally he has grasped the handle of the car lest he should fall and he clings to it, being dragged along, in his effort to recover his footing. The courts put a liberal construction upon the rights of passengers on these cars. In a recent case a man sued the Street Railway Company for injuries received while trying to board one of their cars. He had grasped the handrail and waited for other passengers to enter the car; the start was made with a jerk and he was only partially on the car, having his left foot on the step. He was thrown off, but ran along side of the car, endeavouring to board it, when he was hit by a projection in the street hiding a hole in the pavement; this blow threw him into the hole. His suit was at first dismissed, but on appeal the first decision was pronounced to be an error and the court held that the defendant was bound to give the plaintiff time to board the car, and the evidence proved that reasonable time was not allowed and that in this respect the defendant was negligent. The court held that the plaintiff was not guilty of contributory negligence; having hold of the car and being about to board it, it suddenly started, thereby presenting an emergency which required the exercise of judgment as to the best course to be followed to prevent injury. If to avoid being thrown down by the car he held on to the rail to steady himself until he could let go in safety it was certainly not negligence as a matter of law. But for the existence of this trench in the roadway alongside of the track, which he had not observed, he would probably have escaped injury by adopting the course which he did, but his falling into the trench was caused by his being dragged along by the car. It seemed to the court that the question of contributory negligence was one for the jury. If the car had not started the plaintiff could have got aboard safely. It, however, started when he had hold of the car and the sudden jerk carried him along with it, and if he, to avoid falling, kept hold of the car until he could regain his equilibrium, and in so doing was by the momentum of the car thrown into this trench, it was the sudden starting of the car and the motion contributed by the car to the plaintiff which caused him to fall into the trench from which he sustained the injury for which he sought to recover.

Foreign Relations of the American Medical Association.

It appears from the address of the President of the American Medical Association, Dr. C. A. Reed, that this society had accredited delegates during the last year to several foreign medical conventions, notably the International Medical Congress at Paris, the Dominion Medical Association of Canada, the Mexican National Association, and the Pan-American Medical Congress at Havana. With each of these organisations the American Medical Association sustains relations of peculiar intimacy. As one of the great scientific nations of the earth the United States is naturally an integral part of the International Medical Congress. This association by resolution presented by its present president, took the initiative in 1891 in organising the Pan-American Medical Congress. The first reunion of that Congress was held in Washington in 1893 under the presidency of the late lamented Dr. Pepper; the second was held in the city of Mexico in 1896 under the presidency of Dr. Carmona y Valle; and the third was convened during the last few months in the city of Havana under the distinguished president, Dr. Juan Santos Fernandez. The object of this movement is the establishment of closer relations between the medical profession of the different countries of the Western Hemisphere. Excellent fruit has already been borne in the increased patronage of our medical schools from the far South; in the improved status of American medical practitioners in Latin America; in the better understanding of quarantine questions in the different countries; and in the development of concerted action in the investigation of the medical flora of the Western Hemisphere.

A National Pharmaceutical Laboratory.

The movement for a memorial fittingly to perpetuate the name of William Proctor, jun., was started some months ago by the American Pharmaceutical Association. Its growth has been vigorous and pharmacists in various parts of the country have become identified with the plan. William Proctor, jun., was one of the best-known pharmacists of his day, and by some persons now living he has been called the "Father of Pharmacy." Something will be done in the near future in memory of the results which he obtained in his efforts to enlarge the knowledge of pharmacy and to elevate the calling of the pharmacist. The present proposition is to establish a National Pharmaceutical Research Laboratory. If this should fail of

realisation, the New York State Pharmaceutical Association, with which the project originated, would urge that the name of William Proctor, jun., should be perpetuated and be made widely known to future generations by founding scholarships bearing his name at colleges of pharmacy here, or that medals for conspicuously meritorious work in any of the branches of pharmacy should be given.

July 18th.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Outbreak of Small-pox.

SOME time ago Western Australia altered the quarantine regulations of that State and relieved ships carrying surgeons from medical inspection, *pratique* being granted on the certificate of the ship's surgeon that there was no infectious disease on board. In South Australia the chairman of the Board of Health, Dr. Ramsay Smith, is an advocate of surveillance, as opposed to strict quarantine, and is supported in his views by the Premier of the State. The latter has communicated with the Federal Premier of Australia, stating that if the Commonwealth Government does not propose to take over the quarantine department for some time it will be necessary to bring in an amending Quarantine Act in the South Australian State Parliament, with this object in view. Power to assume control of quarantine is conferred by the Constitution Act, but the transfer cannot be made till a date for handing over the quarantine stations has been fixed by the Commonwealth Parliament. The New South Wales, Victorian, and Queensland authorities uphold strict quarantine, but under their several Acts have no power to insist on the detention in quarantine, in the State, of a patient who prefers to go on in the vessel to the next port of call, but can only quarantine those of the passengers or crew who land. The way these varying regulations work out in practice has been well exemplified recently. The steamer *Chingta* arrived some six weeks ago at Thursday Island and was found to have a case of small-pox on board. The authorities then offered to take the patient off and to isolate him, but the captain decided to go on, as he said the patient could be isolated on board. The steamer went on to Sydney and was quarantined there, and small-pox broke out among the passengers and crew while in quarantine, one patient dying. In the opinion of Dr. Ashburton Thompson, President of the Board of Health, these patients were all infected on the voyage between Thursday Island and Sydney, and if quarantine and isolation had been enforced at Thursday Island the outbreak would not have occurred. More recently the Orient steamer *Ormuz* arrived at Fremantle and was reported free from infectious disease by the ship's surgeon, but, in accordance with the regulations in West Australia, was not boarded or inspected by the port medical officer. Free communication took place with the shore, passengers landed, and other passengers embarked for the eastern ports. On reaching Adelaide the port medical officer boarded and was again informed that there was no infectious disease on board, but as strict precautions were being taken with regard to plague he proceeded to inspect the passengers and crew. Having completed the inspection of the passengers he allowed the mails to go ashore and visitors to come on board. While inspecting the crew he found a man sick and was told by the ship's surgeon that it was not an infectious case. The port officer, however, thought it was small-pox, went ashore and got another opinion and the advice of the President of the Board of Health, and his opinion being confirmed ordered the ship and all on board into quarantine. The Adelaide passengers and visitors were landed at the quarantine station. The *Ormuz* went on to Melbourne, where the Melbourne passengers were quarantined, and the original patient was isolated at the sanatorium. Then the ship went on to Sydney, where the remaining passengers were quarantined. When the Adelaide passengers had been 11 days in quarantine Dr. Ramsay Smith advised that they should be released and kept under surveillance. The Melbourne and Sydney authorities, however, objected and the very next day two cases of small-pox developed among the passengers quarantined at Adelaide. Meanwhile, among those quarantined at Melbourne six cases of small-pox developed, and among those quarantined in Sydney 19 cases, one fatal. One of the cases at Adelaide occurred in a passenger from Fremantle, so that here again the disease was caught on the voyage between the first Australian port, Fremantle, and the next port of call, and the whole outbreak, involving very heavy expense indeed, could have been avoided by proper measures at Fremantle. Further, at Fremantle itself the policeman on duty on the *Ormuz* while there has been attacked with small-pox. In Sydney two cases of small-pox have occurred among the general inhabitants who had no communication whatever with the infected vessels, but were probably infected from the *Chingta* cases, and in Adelaide two of the residents who boarded the *Ormuz*—a newsboy and a constable—and were quarantined with the passengers have developed small-pox. Yet a third muddle has occurred still more recently. When the R.M.S. *Arcadia* arrived at Adelaide the port officer carefully inspected the crew and discovered a steward with a suspicious rash; the diagnosis of small-pox having been confirmed by a second expert opinion, though disputed by the ship's surgeon, the ship was quarantined. Some of the Adelaide passengers elected to go on to Melbourne in the ship, others went to the quarantine station, already crowded with the passengers of the *Ormuz*. On arrival at Melbourne the three experts of the Board of Health pronounced the case not to be small-pox and granted the vessel *pratique*. The 40 Adelaide passengers who came on to Melbourne were then sent back and those who had been quarantined there and mixed with the *Ormuz* passengers were also released.

Prince Alfred Hospital, Sydney.

The foundation-stone of the Queen Victoria Memorial wing of the Prince Alfred Hospital, Sydney, was laid on May 31st by H.R.H. the Duke of Cornwall with great *éclat*. The Royal party were received by Professor Anderson Stuart, President of the hospital, who read an address giving a history of the hospital and detailing the work it had accomplished. After the stone had been laid the Duke of Cornwall made the following speech: "It is with deep satisfaction that the Duchess and I have taken part in this interesting ceremony; for in the first place I should like to hope that possibly our presence here to-day may conduce, even though in the smallest degree, to the advancement of the splendid work which has already been accomplished by the Prince Alfred Hospital. Then I am proud to think that whether I turn to the past history of the hospital or try to look into its future I find a close association with it and my family. His Majesty the King is its patron. It found its birth in the loyal outburst of thankfulness on the part of the people of New South Wales for the recovery of my dear uncle, the Duke of Edinburgh, from the result of a dangerous attack upon his life. In the title, 'Queen Victoria Memorial Pavilions,' which you have chosen for the new buildings, the foundation-stone of which I have had the honour of laying to-day, you identify them for ever with the imperishable memory of our late dearly beloved Sovereign. I doubt whether under the circumstances any more fitting memorial to that great life could have been chosen, for sympathy with the suffering was an all-pervading element in the noble and beautiful character of her who was your first patron and with whose name the hospital will now be associated for all time. Another personal connexion exists in the fact that 20 years ago my dear brother and I visited the hospital, then unopened, and that to-day I have been allowed to inaugurate what will be the completion of the originally conceived scheme. Since that time the hospital, thanks to excellent administration, combined with a zealous and able staff, has achieved results which have earned commendation from a competent hospital authority who spoke of it as one of the best managed institutions in the world. As an example I merely mention that since it has been opened in 1883 some 188,000 people have received medical treatment from it either as indoor or outdoor patients. The rapidly growing population of your city brings an ever daily increased demand to such an establishment, and it is hoped that these new additions will meet the further present requirements for greater accommodation. I am glad to learn that, thanks to the generosity of the public, the necessary funds are now almost guaranteed. I feel confident that you will gladly join with me in offering hearty congratulations to Professor Anderson Stuart and his brother directors, for such liberal support may be taken as a proof of recognition by the Government and the community at large of the inestimable benefits which have been conferred on your suffering fellow creatures by the institution whose direction was fortunately left in their hands."

June 2nd.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The following gentlemen having passed the necessary examinations have been admitted Fellows of the College in the order of their seniority as Members, and have received their diplomas:—

John Beuzeville Byles, diploma of Member dated Nov. 13th, 1891, M.B., B.C.Cantab., L.R.C.P.Lond., Westminster Hospital; Herbert William Kendall, Member, Feb. 11th, 1892, L.R.C.P. Lond., Middlesex Hospital; James Keogh Murphy, Member, May 10th, 1894, M.A., M.D., B.C. Cantab., L.R.C.P. Lond., Cambridge University and St. Bartholomew's Hospital; Robert Earle Newton, Member, July 29th, 1895, M.B., C.M. Glasg., L.R.C.P. Lond., Glasgow University and St. Bartholomew's Hospital; Cecil Banting, Member, Feb. 13th, 1896, M.D., B.S. Lond., L.R.C.P. Lond., University College and Guy's Hospitals; Philip Northcott Vellacott, Member, May 14th, 1896, M.B., B.S. Lond., L.R.C.P. Lond., Guy's Hospital; William Robert Gibson, Member, August 4th, 1896, L.R.C.P. Lond., St. Bartholomew's Hospital; Robert Pugh Rowlands, Member, August 4th, 1896, L.R.C.P. Lond., Guy's Hospital; Ferdinand Stanley Batchelor, Member, July 29th, 1897, L.R.C.P. Lond., Guy's Hospital; Howard Henry Congreve Dent, Member, July 29th, 1897, M.B. Durh., L.R.C.P. Lond., Durham University, Mason University College, Birmingham, and St. Bartholomew's Hospital; Joseph Faulkner Dobson, Member, July 29th, 1897, M.B., B.S. Lond., L.R.C.P. Lond., Yorkshire College and General Infirmary, Leeds; Francis Astley Cooper Tyrrell, Member, Nov. 11th, 1897, B.A., M.B., B.C. Cantab., L.R.C.P. Lond., Cambridge University, St. Thomas's and King's College Hospitals; Arthur Hyde Greg, Member, Feb. 10th, 1898, L.R.C.P. Lond., Cambridge University and St. Thomas's Hospital; George Ernest Gask, Member, August 2nd, 1898, L.R.C.P. Lond., St. Bartholomew's Hospital; William Halliburton McMullen, Member, Nov. 10th, 1898, M.B. Lond., L.R.C.P. Lond., King's College Hospital; William Howard Unwin, Member, Nov. 10th, 1898, M.B. Lond., L.R.C.P. Lond., University College and Charing Cross Hospital; Harold Shuttleworth Barwell, Member, Feb. 9th, 1899, L.R.C.P. Lond., St. George's Hospital; Harold Vaughan Pryce, Member, Feb. 9th, 1899, B.A. Cantab., L.R.C.P. Lond., Cambridge University and St. Bartholomew's Hospital; Harold Burrows, Member, May 11th, 1899, M.B. L.R.C.P. Lond., St. Bartholomew's Hospital; Graham Scales Simpson, Member, July 27th, 1899, L.R.C.P. Lond., L.D.S. Eng., Guy's Hospital; Herbert George Tymms, Member, Nov. 2nd, 1899, M.B., B.S. Melb., L.R.C.P. Lond., Melbourne University and St. Bartholomew's Hospital; William Henville Lowman, Member, May 10th, 1900, M.B., B.S. Lond., L.R.C.P. Lond., University College, Bristol, and King's College Hospital; Robert Young Aitken, Member, Feb. 7th, 1901, M.D.Glasg., L.R.C.P. Lond., Glasgow University; and Joseph Cunning, not a Member, M.B. Melb., Melbourne University and St. Bartholomew's Hospital.

Fifty-six candidates presented themselves for this examination, 25 of whom passed, one of whom not having attained the legal age of 25 years, will receive his diploma at a future meeting of the Council. 31 candidates were referred, 24 for six months and seven for 12 months.

UNIVERSITY OF LONDON.—At the Intermediate Examination in Medicine, held in July, the following candidates were successful:—

EXAMINATION FOR HONOURS.

Anatomy.—First Class: Seymour Gilbert Barling* (Deserving of Medal), Birmingham University; Ernest Edgar Maples (Gold Medal), St. Bartholomew's Hospital; William Gordon Taylor (Exhibition and Medal), Middlesex Hospital; and Edwin Robert Wheeler, King's College. *Second Class:* William Fraser Annand, University College; Elizabeth Bolton, London School of Medicine for Women; Alexander George Gibson, B.Sc., Oxford University; and Frederick William Weeks Smith, St. Thomas's Hospital. *Third Class:* Frank Alcock, Owens College; Frederic Wood Jones, London Hospital; and Alexander Moxon Webber, Guy's Hospital.

Physiology and Histology.—First Class: George Hall (Exhibition and Medal), University College; Thomas de Smith (Gold Medal), Cambridge University and London Hospital; and Alexander Moxon Webber, Guy's Hospital. *Second Class:* Joseph Anthony Ferrière, University College; Alexander George Gibson, Oxford University; Frederic Wood Jones, London Hospital; Gerald Warren Russell, Guy's Hospital; and Kenrick Stanton Wise, St. Bartholomew's Hospital. *Third Class:* Seymour Gilbert Barling, Birmingham University; Neville Samuel Finzi, University College, and Maurice George Louisson and Henry Francis Bell Walker, Guy's Hospital.

Organic Chemistry.—Second Class: Ernest Edgar Maples, St. Bartholomew's Hospital. *Third Class:* Kenrick Stanton Wise, St. Bartholomew's Hospital.

Materia Medica and Pharmaceutical Chemistry.—First Class: Ernest Edgar Maples, St. Bartholomew's Hospital, and Arthur Campbell Stark (Exhibition and Medal), Westminster Hospital. *Second Class:* Sophie Grace Hacking, B.Sc. London School of Medicine and Bedford College. *Third Class:* Joseph Anthony Ferrière, Neville Samuel Finzi, and George Hall, University College; Philip Rees, B.Sc., Charing Cross Hospital; and Gerald Warren Russell, Guy's Hospital.

* Obtained number of marks qualifying for the Medal.

The foregoing list, published for the convenience of candidates, is provisional only, and is not final until the reports of the examiners shall have been confirmed by the Senate.

SOCIETY OF APOTHECARIES OF LONDON.—In July the following candidates passed in the subjects indicated:—

Surgery.—C. H. Allan (Sections I. and II.), London Hospital; A. G. H. Anthoniaz (Section I.), University College Hospital; F. A. Beattie (Sections I. and II.), Guy's Hospital; P. C. Burgess (Section I.), Middlesex Hospital; C. E. C. Child (Section I.), Charing-cross Hospital; T. J. M. Clapperton (Sections I. and II.), King's College Hospital; E. A. Dunn (Section II.), Royal Free Hospital; J. P. E. Henery, St. George's Hospital; H. C. Hocken (Section II.), Cambridge and Westminster Hospital; C. E. A. Huddart (Sections I. and II.), London Hospital; R. L. Jones (Sections I. and II.), Middlesex Hospital; F. P. Joscelyne (Section II.), Leeds; C. C. Morgan (Section I.), St. Bartholomew's Hospital; B. E. Sansom (Section II.), St. Thomas's Hospital; C. V. Smith, University College Hospital; P. P. Tobit (Section I.), King's College Hospital; F. I. Trimmer (Sections I. and II.), London Hospital; A. G. Wilson (Sections I. and II.), Manchester; and E. Yoxall (Section I.), Birmingham.

Medicine.—F. A. Beattie (Sections I. and II.), Guy's Hospital; J. E. Bolton (Section I.), Leeds; G. M. Crockett (Section I.), K. A. Dawson (Section I.), and E. A. Dunn (Section II.), Royal Free Hospital; H. C. Hocken (Sections I. and II.), Cambridge and Westminster Hospital; F. P. Joscelyne (Section II.), Leeds; A. E. Malaher, St. Thomas's Hospital; M. E. Martin (Section I.), Royal Free Hospital; E. S. Perkins, Leeds and Guy's Hospital; R. Richardson (Sections I. and II.), Leeds; P. G. Sheppard (Sections I. and II.), Cambridge and Liverpool; J. E. Skey (Section I.), Westminster Hospital; and A. G. Wilson (Sections I. and II.), Manchester.

Forensic Medicine.—F. A. Beattie, Guy's Hospital; J. E. Bolton, Leeds; G. M. Crockett and K. A. Dawson, Royal Free Hospital; E. H. Forjett, Edinburgh; C. J. Francis, Guy's Hospital; H. C. Hocken, Cambridge and Westminster Hospital; M. E. Martin, Royal Free Hospital; E. S. Perkins, Leeds and Guy's Hospital; F. P. Rose, London Hospital; J. E. Skey, Westminster Hospital; and A. G. Wilson, Manchester.

Midwifery.—F. A. Beattie, Guy's Hospital; F. G. Bennett, University College Hospital; F. J. Birks, Sheffield; P. J. R. Bucknill, Manchester and Dublin; W. V. Braddon, Cambridge and Manchester; A. N. Collier, Manchester; W. H. Crossley, St. Bartholomew's Hospital; W. R. Davies and C. W. Gibson, Guy's Hospital; J. M. King, University College Hospital; E. A. Le Maistre, London Hospital; D. E. Lockwood, Royal Free Hospital; M. B. Oliver, University College Hospital; J. A. W. Webster, St. Mary's Hospital; and A. G. Wilson, Manchester.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—F. A. Beattie, F. J. Birks, P. J. R. Bucknill, E. A. Dunn, H. C. Hocken, F. P. Joscelyne, A. E. Malaher, C. V. Smith, and A. G. Wilson.

DEPUTY CORONER FOR NORTH SOMERSET.—Mr. R. Whiteside Statham, M.R.C.S. Eng., L.S.A., of Cheddar, has been appointed deputy coroner for North Somerset owing to the resignation of Dr. J. Wallace of Weston-super-Mare.

UNIVERSITY COLLEGE, CARDIFF.—The registrar of Cardiff University College has received an intimation from Dr. Isambard Owen stating that he is unable to accept the appointment of principal of the college.

A NEW MEDICAL JOURNAL.—An adjourned meeting of members of the medical profession practising obstetrics and gynæcology was held in London on July 24th under the presidency of Sir John Williams, at which it was unanimously resolved to establish a new journal to be called *The British and Colonial Journal of Obstetrics and Gynæcology*, and to raise the funds required for its publication by the formation of a limited liability company.

PRESENTATION TO A MEDICAL PRACTITIONER.—Dr. A. Davidson, for over five years senior assistant medical officer at the Dorset County Asylum, has, on the occasion of his leaving to take up work in the colonial service, received from the officers and staff a silver tea service, consisting of four pieces. The inscription on the teapot is:—"Presented to A. Davidson, M.D., by the officers and staff of the Dorset County Asylum in appreciation of his zealous work and kind attention."

NEWPORT (MON.) HOSPITAL.—The new hospital at Newport, which has been erected at a cost of over £30,000, is now completed, and the patients have been removed from the old building which was recently sold for £3900. The new structure stands on four and a half acres of land and will provide accommodation for 84 in-patients. The medical staff invited the local members of the profession to pay a visit of inspection on July 25th, and the formal opening by Lord Tredegar has been arranged for August 5th.

FREEMASONRY.—Medical Freemasons may be glad to hear of a new song entitled "The Freemason," written and composed by Dr. T. Wilson Parry and dedicated by permission to the Most Worshipful Grand Master of England, H.R.H. the Duke of Connaught, the proceeds of the sale of which will be given to the Royal Masonic Institution for Girls. Copies may be obtained from the author, Youlgreave, Bakewell, Derbyshire, or from Messrs. Kenning and Son, Great Queen-street, London, W.C., price 1*s.* 6*d.*

Parliamentary Intelligence.

HOUSE OF COMMONS.

THURSDAY, JULY 18TH.

The Army Medical Service.

MR. T. M. HEALY asked the First Lord of the Treasury whether he was aware of the feeling existing in the Royal Colleges of Surgeons and of Physicians in Ireland at the failure to give the Irish faculty adequate representation on the Committee on the Army Medical Service; was he aware that in several years the majority, or a large proportion, of the men joining the Army Medical Service held Irish qualifications; and, seeing that five of the members of the committee represent London schools, could he explain why only one had been allotted to Ireland and one to Scotland; and would he give a return of the medical men in the Indian, British, and naval services, distinguishing those holding English, Irish, and Scotch qualifications for the years 1890, 1895, and 1900; and would anything be done to increase the representation of Ireland in the composition of the committee.—MR. BALFOUR replied: The members of this committee were chosen not with a view of representing various nationalities but to render the Secretary of State practical assistance in the task of reorganising the Army Medical Service. As, however, my right hon. friend has no desire to appear to slight any school he some time back asked Sir William Thomson to join the committee, and he has reason to hope that that gentleman will be able to do so.

The Nursing Question in Ireland.

MR. WILLIAM JOHNSTON asked the Chief Secretary to the Lord Lieutenant of Ireland (1) whether he was aware that an inquiry had been held in Downpatrick by a medical inspector of the Local Government Board as to the necessity of providing a qualified midwife for Strangford Dispensary District, and that it was proved that there had been from time to time deaths from puerperal fever, from improper nursing, before a regularly qualified midwife was appointed; and (2) seeing that since the resignation of the last holder of the position, on May 1st, 1900, the guardians had persistently refused to appoint a successor, could he say whether there was any power in the Local Government Board to compel the Downpatrick guardians to make the appointment.—MR. WYNDHAM replied: The facts are as stated in the first paragraph. The Board has frequently exhorted the guardians to appoint a midwife for this dispensary district since the occurrence of the present vacancy in May, 1900. The reply to the second paragraph is in the affirmative. The Board will again communicate with the guardians, insisting on the necessity for such an appointment.

Sanitary Defects in Post-offices.

MR. SCHWANN asked the Secretary to the Treasury, as representing the Postmaster-General, whether he was aware that the British Postal Medical Officers' Association had recently issued a statement in which it was contended that sanitary defects in post-offices, when reported upon by them, in many cases remained unremedied; and whether, in view of the fact that the Tweedmouth Committee expressed its opinion that the demands of the medical officers should be carried out, the Postmaster-General would direct the Office of Works to carry this injunction into effect.—MR. AUSTEN CHAMBERLAIN replied: The Postmaster-General is aware of the statement referred to. Every report by a local medical officer on the sanitary condition of a post-office is fully investigated, and if alleged defects are confirmed remedies as far as practicable are applied. The opinion quoted was not expressed by the Tweedmouth Committee, but appears in a statement put in by the medical officers themselves before the committee. No good reason is seen for changing the present practice in this respect.

FRIDAY, JULY 19TH.

Irish Graduates in the Army Medical Service.

MR. YOUNG asked the Secretary of State for War whether he could state how many Irish graduates were in the Army Medical Department, and in what proportion they were to the English and Scotch graduates.—MR. BRODRICK replied that the number of Irish graduates was 334, being 37 per cent., as compared with English 35 per cent. and Scotch 28 per cent.

Medical Professorships in Ireland.

MR. MACARTNEY asked the Chief Secretary to the Lord Lieutenant of Ireland if he could state why the appointments to certain medical professorships in the Queen's College, Belfast, had been limited to a term of seven years, whereas in the Queen's College, Cork, similar appointments had been recently made for life.—MR. WYNDHAM replied: The system of limiting those appointments to a term of seven years, with power of re-appointment on the expiration of the period, applies equally to each of the Queen's Colleges in Ireland. There are two cases in the Cork College and one in the Belfast College, to which the practice, through a misunderstanding or oversight, was not applied.

MONDAY, JULY 22ND.

The Condition of the Concentration Camps.

MR. BRODRICK announced in reply to a question that the committee of ladies whom it was proposed to appoint to visit the Boer concentration camps and cooperate with the local committees would be composed as follows: Lady Knox, who had had considerable experience of South Africa before and during the war, and whose ministrations to the sick and wounded in Ladysmith did much to alleviate their sufferings; Mrs. Fawcett, LL.D., who had taken a leading position in all movements for the improvement of the condition of working women; Miss Lucy Deane, His Majesty's Inspector of Factories, who had had very large experience in special investigations and in inquiries into matters relating to women and children; Miss Scarlett and Dr. Jane Watherston who were medical graduates with considerable practical experience of work abroad, and were both now in South Africa; and Miss Brereton who had been in charge of the Yeomanry Hospital in South Africa, and who had had much administrative experience. The appointment of the two last-named could not be completed pending further information as to the time which they could spare from their professional calls. Lady Knox, Mrs. Fawcett, and Miss Deane had left for South Africa that morning.

The Increasing Use of Cocaine.

MR. MACDONA asked the Home Secretary whether his attention had been called to the death of two actresses caused by taking poisonous doses of cocaine; and considering the increase in the practice of taking this drug internally whether he would take steps, by legislation or otherwise, to place some restriction upon the sale of cocaine except to medical men and others skilled in its legitimate use.—MR. RITCHIE replied: I am informed that a committee of the Privy Council has been appointed to consider the first schedule of the Poison Act, 1868, and that the matter will be referred to them.

Drunkards Bill.

This Bill, introduced in the House of Lords by the Bishop of Winchester and very much amended in that chamber at the instance of the Government, was withdrawn at this sitting from the House of Commons and consequently abandoned for the session.

TUESDAY, JULY 23RD.

The Dysentery Commission.

SIR WALTER FOSTER asked the Secretary of State for War whether the report of the commission or committee appointed last August to inquire into the nature, causation, pathology, and modes of prevention (more particularly as affecting armies in the field) of dysentery and its connexion, if any, with enteric fever, had been received, and whether it would be laid upon the table of the House before the discussion of the army medical vote.—MR. BRODRICK replied: No report has yet been received from the Dysentery Commission.

Dental Provision at the Duke of York's School.

MR. CATHCART WASON asked the Secretary of State for War whether his attention had been called to the fact that there was no dental surgeon appointed to look after the teeth of the boys, orphans of British soldiers, at the Duke of York's School, Chelsea, or at the corresponding school for girls; and, having regard to the importance of a sound mouth to the children, and to the fact that many of the boys joined the Army, whether such appointment would be made without further delay.—MR. BRODRICK replied: Simple cases are dealt with by the medical officer occasionally; when special treatment has been required the boys have been sent to a dental surgeon or to the dental hospital. This would appear to be sufficient.

The London Water Question.

On the motion of Sir J. BLUNDELL MAPLE a Bill was introduced and formally read a first time to vest the undertakings of the London water companies in a single public authority. It is impossible that such a Bill introduced by a private member can be passed or even substantially advanced during the present session.

THE NEW FACTORY AND WORKSHOP LEGISLATION.

PROCEEDINGS IN THE GRAND COMMITTEE.

At the meeting of the Grand Committee on Thursday, July 18th, very few points of interest to medical men were raised. In connexion with the clause requiring general registers to be kept in every factory or workshop, Sir FORTESCUE FLANNERY moved an amendment to have the names of the married women among the workers inserted in these general registers. He did so, he said, in order that married women might not be compelled or allowed to work in factories or workshops immediately before or after confinement. MR. RITCHIE refused to accept the amendment, saying that no case had been made out for it and that it would be a novelty in this class of legislation to distinguish between married and single women. The committee rejected the amendment by 15 to 8 votes. Asked for an explanation of the meaning of Clause 26, MR. RITCHIE said that its purpose was to require the medical officer of health to report all workshops in which he found a child or young person employed, where there was no abstract of the Factory Acts and where presumably there was no inspection. He further said that if the law as it stood were literally carried out the medical officer of health would have to report every workshop in which he found a child or young person employed, even though it was regularly inspected. Clause 40—where there is no certifying surgeon for a factory or workshop the poor-law medical officer for the district in which the factory or workshop is situated shall act for the time being as the certifying surgeon for the factory or workshop—was passed by the committee without a word of comment. When a proposal was made to bring post-offices under the Factory and Workshop Acts, MR. RITCHIE said that this could not be done, but he explained that an arrangement has been made with the Postmaster-General under which the inspectors of the Home Office would assist the Post Office Department in all matters connected with the sanitation of post-offices.

The Grand Committee met again on Monday, July 22nd, and on this occasion made very substantial progress with the Bill.—MR. STRACHEY moved an amendment the object of which was to bring all post-offices within the scope of factory legislation.—MR. JOHN BURNS, in supporting the amendment, argued that post-offices should be open to the inspection not only of the factory inspector but also of the medical officer of health and the sanitary inspector of the district, because there was much information to show that many post-offices were not in a sanitary condition.—MR. RITCHIE opposed the amendment on the ground that if post-offices were subject to factory hours of employment and other conditions the public service would be entirely upset, but he assured the committee that he would do everything in his power to see that post-offices were maintained in a sanitary condition.—MR. STRACHEY suggested that his amendment might be altered so as to cover only inspection as to sanitation, but MR. RITCHIE said that he could not accept it even in this modified form.—The committee rejected the amendment by 28 to 15 votes.—The question which occupied most time at this sitting was the question of the regulation of laundries. In the Bill as introduced it was proposed to place all laundries under the Factory Acts, but in the case of laundries in religious and charitable institutions to modify the ordinary factory inspection by entrusting it to a visitor to be agreed upon by the chief factory inspector and the managers of the particular institution. The Irish members objected to any alteration in the existing state of the law and threatened opposition to the Bill as a whole if the Home Secretary insisted on the provision with regard to laundries

in religious and charitable institutions. In these circumstances Mr. RITCHIE announced that rather than lose the Bill he would agree to the withdrawal of the provision and the insertion in the clause of words declaring that nothing in the clause should refer to institutions conducted in good faith for religious or charitable purposes. While he said this he intimated that he was still convinced that these institutions should be dealt with, and he would not commit himself or the Government in any way to non-dealing with the question on some other occasion. After a long and somewhat heated debate the Committee agreed to the demands of the Irish Members by 30 to 24 votes. No doubt the subject will be discussed again when the report stage of the Bill is reached in the House of Commons.

Another meeting of the committee was held on Tuesday, July 23rd.—On the motion of Mr. RITCHIE the following new clause was inserted in the Bill—viz.: (1) If the Secretary of State is satisfied that the provisions of the Factory Acts as amended by this Act, or of the law relating to public health in so far as it affects factories, workshops, and workplaces, have not been carried out by any district council, he may, by order, authorise an inspector to take, during such period as may be mentioned in the order, such steps as appear necessary or proper for enforcing those provisions; (2) an inspector authorised in pursuance of this section shall, for the purpose of his duties thereunder, have the same powers with respect to workshops and workplaces as he has with respect to factories; and he may for that purpose take the like proceedings for enforcing the provisions of the Factory Acts or of the law relating to public health, or for punishing or remedying any default as might be taken by the district council; and he shall be entitled to recover from the district council all such expenses in and about any proceedings as he may incur and as are not recovered from any other person; (3) Section 1 of the Act of 1891 is hereby repealed."—Sir CHARLES DILKE moved to insert a clause giving the Secretary of State power to make orders prescribing for any class of factories or workshops where children, young persons, or women are required in the course of their employment to lift heavy weights, the highest limits of weights that may be lifted by these children, young persons, or women. He explained that while legislation of this kind was novel in this country it was not unknown on the continent, and was found to work well there.—Mr. RITCHIE, while declining to accept the clause, said that whatever powers might exist in the hands of the certifying surgeon in the direction indicated would be exercised. In the case of children the certifying surgeon might make it a condition in granting a certificate of fitness that the child should not be employed in lifting heavy weights, or he might fix a limit of weight to be lifted.—After some discussion Sir CHARLES DILKE agreed to withdraw the clause.—A proposal made by Captain JESSEL to have the notices with regard to anthrax and lead and arsenical poisoning sent in the first instance to the medical officer of health for the district instead of the chief inspector of factories was not pressed. Mr. RITCHIE pointing out that it would interfere with the administration of the law and lead to delay. Sir FORTESCUE FLANNERY moved to insert in the Bill this clause—viz.: "Upon every notification by a medical man of a case which he believes to be anthrax poisoning the medical practitioner attending the patient shall, if no injury to the patient would, in the opinion of the medical practitioner, arise therefrom, immediately forward a specimen of the serum to a bacteriological expert approved by the Secretary of State for bacteriological examination, and in each fatal case of anthrax a specimen of the serum taken as soon after death as possible shall be forwarded in like manner by the practitioner who certifies the death." The hon. member having explained that anthrax was communicated with great facility to workers in wool, skin, and hair, said that during the last 10 or 15 years the disease had very much increased in this country. In 1899 there were 55 cases and in 1900 there were 57 cases. Unfortunately most of the cases were fatal. The disease was not very well understood by medical men. They themselves admitted that great necessity existed for further examination and research with regard to it. The Home Office had very properly given the greatest facilities in their power for research in the hope of checking the disease and there had been issued to certifying surgeons a memorandum of invitation and facilities had also been given for the bacteriological examination of specimens taken from infected persons. The clause he proposed had been approved by employers and employed in the West Riding of Yorkshire, but serious difficulties had been pointed out by the medical profession, and therefore he proposed to alter his clause so as simply to state that the Home Secretary might by order make regulations for the better bacteriological investigation of anthrax.—The CHAIRMAN of the committee said that if the hon. Member desired to make his proposal in this form he would have to do so at a later stage in the proceedings. The consideration of the subject was consequently postponed.—The committee shortly afterwards adjourned.

BOOKS, ETC., RECEIVED.

BALE AND SONS, Great Titchfield-street, London.
The Association of Inguinal Hernia with the Descent of the Testis. The Bradshaw Lecture for 1900. By John Langton. Price 5s.

BAILLIÈRE ET FILS, Paris.
Traité de Chirurgie. By A. Le Dentu and Pierre Delbet. Price 17 francs.

BAILLIÈRE, TINDALL, AND COX, Henrietta-street, London.
The Theory and Practice of Military Hygiene. By E. L. Munson, A.M., M.D. Price 32s.

BERGMANN, J. F., Wiesbaden.
Mnemotechnik der Receptologie. By Dr. C. Th. Huetlin. Price 1s. 3d.
Verhandlungen der Siebzehnten Versammlung der Gesellschaft für Kinderheilkunde in Achen. 1900. By Dr. Emil Pfeiffer. Price 8s.
Grundzüge der Allgemeinen Anatomie. By Dr. Friedrich Reinke. Price 7s. 9d.
Die Anorganischen Salze im Menschlichen Organismus. Price 5s.
Der Farbensinn der Tiere. By Dr. W. A. Nagel. Price 1s.
Der Ausbau im Diagnostichen Apparat der Klinischen Medizin. Price 5s.
Bericht über die Achtundzwanzigste Versammlung der Ophtalmologischen Gesellschaft, Heidelberg. 1900. Price 8s.
Der Hypnotismus. By Dr. L. Loewenfeld. Price 9s.
Pathologie und Therapie der Herzneurosen. By Dr. A. Hoffmann. Price 7s. 9d.
Das Selbstbewusstsein; Empfindung und Gefühl. By Theodor Lipps. Price 1s.
Vorlesungen über die Pathologischen Anatomie des Rückenmarks. By Dr. S. Sacki and Dr. H. Schmaus. Price 16s.
Das Asthma, sein Wesen und seine Behandlung. By Dr. W. Brugelmann. Price 4s.
Die Therapeutischen Leistungen des Jahres 1900. Price 8s.

CASSELL AND CO., London.
Tumours; Innocent and Malignant. By J. Bland-Sutton. New edition. Price 21s.

CHURCHILL, J. AND A., Great Marlborough-street, London.
The Ophthalmoscope; a Manual for Students. By G. Hartridge, F.R.C.S. Fourth edition. Price 4s. 6d.

DAVIS AND CO., Philadelphia, New York, and Chicago.
Annual and Analytical Cyclopædia of Practical Medicine. By Charles E. de M. Sajous, M.D. Vol. vi. Price not stated.

DOIN, OCTAVE, Paris.
Bibliographia Lactaria. By Dr. Henri de Rothschild. Price not stated.

ENKE, FERDINAND, Stuttgart.
Atlas der Nasenkrankheiten. Parts 5, 6, and 7. Price 6 marks each.

FISCHER, GUSTAV, Jena.
Klinisches Jahrbuch. Vol. viii., Part I. Price 5 marks.
Die Protozoen. By Dr. F. Doflein. Price 7 marks.

GREEN AND SONS, Edinburgh.
Encyclopædia Medica. Vol. viii. Menstruation to Orbit. Price not stated.

LONGMANS, GREEN, AND CO., Paternoster-row, London.
History of Intellectual Development. Vol. iii. By John Beattie Crozier. Price 10s. 6d.

MACMILLAN AND CO., London.
Optics; a Manual for Students. By A. S. Percival, M.A., M.B. Price 10s.

MALOINE, A., Paris.
Le Diagnostic Précoce de la Tuberculose Pulmonaire. By Drs. Jourdin and Fischer. Price 2 francs 50 cents.

REBMAN, LIMITED, Shaftesbury-avenue, London.
A System of Physiologic Therapeutics. Vol. ii. Electrotherapy. By George W. Jacoby, M.D. Price 10s. 6d.

SMITH, ELDER, AND CO., Waterloo-place, London.
A Retrospect of Surgery during the Past Century. The Hunterian Oration for 1901. By John Poland, F.R.C.S. Price 5s.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

BYHAM, W. L., L.R.C.S., L.R.C.P. Edin., has been appointed Medical Officer for the Sunbury District of the Staines Union, Middlesex.

COLLINSON, HAROLD, M.B. Lond., M.R.C.S., L.R.C.P., has been appointed Resident Casualty Officer to the General Infirmary, Leeds.

CRAWSHAW, E. E., M.R.C.S., L.R.C.P., has been appointed Resident Obstetric Officer to the General Infirmary, Leeds.

DAVIDSON, A., M.D., has been appointed, by the Colonial Secretary Port Medical Officer, Singapore.

FLEMING, A. D., M.B., M.S. Edin., has been appointed Certifying Surgeon under the Factory Acts for the Kelso District of the County of Roxburgh.

FOWLER, H. W., M.B. Edin., has been appointed Assistant Medical Electrician to the Royal Infirmary, Edinburgh.

MACLEAN, E. J., M.D. Edin., M.R.C.P., has been appointed Gynæcologist to the Cardiff Infirmary.

MACMURCHY, HELEN, M.D. Toronto, has been appointed a Resident Medical Assistant to the General Hospital, Toronto, Canada.

NASH, J. T. C., M.D. Edin., D.P.H. Cantab., has been appointed Medical Officer of Health for the Borough of Southend-on-Sea.

ORFORD, T. C., M.R.C.S., L.R.C.P., has been appointed Resident Medical Officer to the Salford Union Infirmary.

PAGET, O., M.B., B.S. Cantab., has been appointed Medical Officer of Health of Fremantle, Western Australia.

PERCIVAL, G. H., M.B. Lond., has been re-appointed Medical Officer of Health of Northampton Rural Sanitary District.

PRINGLE, A. M. N., M.B. Edin., has been appointed Medical Officer of Health of Manchester Port.

ROBIE, GEO., M.B., M.Ch. Edin., has been appointed Senior Assistant Medical Officer to the Dorset County Asylum, vice A. Davidson, M.D., resigned.

RUTHERFORD, R. A., L.R.C.P., L.R.C.S. Edin., has been appointed Certifying Surgeon under the Factory Acts for the Kinlough Dispensary District of the Ballyshannon Union.

SCOTT, J. G. C., M.B. Edin., has been appointed Medical Officer of Health of Castle Donington Urban Sanitary District.

SPARKS, J. P., M.D. Durh., has been appointed Medical Officer of Health of Whitley and Monkseaton Urban Sanitary Districts.

STEVENSON, EDGAR, M.D. Aberd., has been appointed Demonstrator in Ophthalmology at University College, Liverpool.

STREETEN, F. E., L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health of Swindon Urban Sanitary District.

TURNER, D. F. D., M.D. Edin., has been appointed Medical Electrician to the Royal Infirmary, Edinburgh.

WARDE, WILFRID B., M.D., M.R.C.P., has been appointed Assistant Physician to the Hospital for Diseases of the Skin.

WIGHAM, J. H., L.R.C.P. Edin., L.R.C.S. Edin., L.F.P.S.G., has been appointed Medical Officer of Health of South Molton Municipal Borough.

WILKINS, A. G., M.B., Ch.B., has been appointed Resident Medical Officer to the Salford Union Infirmary.

WILKINSON, J. HOWARD, M.R.C.S. Eng., L.R.C.P. Lond., D.P.H. Oxon., has been appointed an Honorary Surgeon to the Guest Hospital, Dudley.

WOOD, A. G., M.R.C.S. Eng., L.R.C.P. Edin., has been re-appointed Medical Officer of Health of Ledbury Urban Sanitary District.

YOUNG, W. B., M.B. Edin., has been appointed Medical Officer of Health of Applecross (Ross-shire) Rural Sanitary District.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BIRMINGHAM AND MIDLAND SKIN AND URINARY HOSPITAL, John Bright-street.—Surgical Assistant for six months, renewable. Honorarium at rate of 50 guineas per annum.

BIRMINGHAM WORKHOUSE INFIRMARY.—Assistant Resident Medical Officer. Salary £100 per annum, with furnished apartments, rations, &c.

BRADFORD HOSPITAL AND WORKHOUSE.—Second Resident Assistant Medical Officer. Salary £100, with rations, apartments, and washing.

BRECON INFIRMARY.—Resident House Surgeon, unmarried. Salary £100 per annum, with furnished apartments, board, and attendance.

BRIDGWATER INFIRMARY.—House Surgeon. Salary £80 per annum, with board and residence.

BRISTOL GENERAL INFIRMARY.—Casualty Assistant House Surgeon. Salary £50 per annum, with board, residence, &c.

CARDIFF INFIRMARY.—Honorary Anæsthetist.

CHELTENHAM GENERAL HOSPITAL.—Junior House Surgeon. Salary £70 per annum, with board, lodging, and washing.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria Park, E.—Second House Physician for six months. Salary at rate of £30 per annum, with board, residence, and washing.

CLAYTON HOSPITAL AND WAKEFIELD GENERAL DISPENSARY.—Junior House Surgeon, unmarried. Salary £80 per annum, with board, lodging, and washing.

CRAIGLEITH POORHOUSE AND HOSPITAL, Edinburgh.—Resident Medical Officer. Salary at rate of £100 per annum, with board and apartments.

DENBIGHSHIRE INFIRMARY, Denbigh.—House Surgeon. Salary £100, with board, residence, and washing.

DEVONSHIRE HOSPITAL, Buxton, Derbyshire.—Assistant House Surgeon. Salary £50 per annum, with furnished apartments, board, and washing.

DUMFRIES AND GALLOWAY ROYAL INFIRMARY.—House Surgeon. Salary £50 per annum, with board and washing. Also Assistant House Surgeon. Salary £25 per annum, with board and washing.

EAST SUFFOLK AND IPSWICH HOSPITAL.—Second House Surgeon, unmarried. Salary £80 per annum, with board, lodging, and washing.

GENERAL INFIRMARY, Leeds.—Three House Physicians and one House Surgeon. Board, lodging, and washing provided.

GUEST HOSPITAL, Dudley.—Assistant House Surgeon for six months. Salary £40 per annum, with residence, board, and washing.

HALIFAX UNION HOSPITAL, Salterhebble.—Resident Medical Officer. Salary £140 per annum, with apartments, rations, and washing.

HORTON INFIRMARY, Banbury.—House Surgeon and Dispenser. Salary £80 per annum, with board and lodging.

HOSPITAL FOR SICK CHILDREN, Newcastle-on-Tyne.—Resident Medical Officer. Salary £100, with board, lodgings, and laundry.

HULL ROYAL INFIRMARY.—Casualty Officer. Salary £80 per annum, with board and lodging.

LAWN HOSPITAL FOR INSANE, Lincoln.—Assistant Medical Officer. Salary £100.

LINCOLN COUNTY HOSPITAL.—Assistant House Surgeon for six months, eligible for re-election. Honorarium of £25 for each period of six months, with board, residence, and washing.

LIVERPOOL EYE AND EAR INFIRMARY.—Out-patient Assistant and Pathologist.

LONDON HOSPITAL, Whitechapel, E.—Assistant Director of the Pathological Institute. Salary £200 per annum.

NORTH LONDON HOSPITAL FOR CONSUMPTION, Hampstead.—Junior Resident Medical Officer for six months. Honorarium at rate of £60 per annum.

NORTH STAFFORDSHIRE INFIRMARY AND EYE HOSPITAL, Hartshill, Stoke-upon-Trent.—Assistant House Surgeon for six months. Board, apartments, and washing, and at least £10 at the end of six months.

NORTH WALES COUNTIES LUNATIC ASYLUM, Denbigh.—Second Assistant Medical Officer. £120 per annum, increasing to £160, with board, residence, and washing.

NOTTINGHAM GENERAL DISPENSARY.—Assistant Resident Surgeon, unmarried. Salary £160 per annum, increasing £10 every year, with furnished apartments, attendance, light, and fuel.

OLDHAM INFIRMARY.—Senior House Surgeon. Salary £100 per annum, with board, washing, and residence.

OXFORD, COMBINED RURAL AND URBAN DISTRICT COUNCILS OF.—Medical Officer of Health. Salary £750 per annum.

PARISH OF GLENELG, SOUTHERN DIVISION.—Medical Officer. Salary £120 per annum.

PARISH OF ST. MARY, Islington.—Dentist. Salary £20 per annum.

PRESTON ROYAL INFIRMARY.—Assistant House Surgeon. Salary £60 per annum, with board, lodging, and washing.

ROYAL ALBERT HOSPITAL, Devonport.—Assistant House Surgeon for six months. Salary at rate of £50 per annum, with board, lodging, and washing.

ROYAL CORNWALL INFIRMARY.—House Surgeon, unmarried. Salary £100, increasing by £10 a year, with board (excluding stimulants) and apartments.

ROYAL EYE HOSPITAL, Southwark, S.E.—House Surgeon for six months, renewable. Fifty guineas per annum, with board and residence. Also unsalaried Clinical Assistants.

ROYAL HOSPITAL FOR DISEASES OF THE CHEST, City-road, E.C.—House Physician for six months. Salary at rate of £60 per annum, with furnished apartments, board, and washing.

ROYAL SEA-BATHING HOSPITAL, Margate.—Two Resident Surgeons, a Senior and Junior. Salary £120 and £80 per annum respectively, with board and residence.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—Junior House Surgeon for six months. Salary at rate of £50 per annum, with rooms, board, and washing. Also Locum Tenens for Junior House Surgeon.

RUBERY HILL ASYLUM, Barnt Green, Worcestershire.—Junior Assistant Medical Officer. Salary £130 per annum, with board, furnished apartments, &c.

ST. MATTHEW, BETHNAL-GREEN INFIRMARY, Cambridge-road, N.E.—First Assistant Medical Officer, unmarried. Salary £150 per annum, with board, lodging, and laundry.

SALOP INFIRMARY, Shrewsbury.—House Surgeon. Salary £100 per annum, with board, washing, and residence.

SOMERSET AND BATH LUNATIC ASYLUM, Wells, Somerset.—Medical Superintendent. Salary £800 per annum, with furnished house and allowances.

TOTTENHAM HOSPITAL.—Senior Resident Medical Officer. Salary £90 per annum, with board, residence, and laundry.

TOXTETH PARK WORKHOUSE AND INFIRMARY.—Assistant Medical Officer. Salary £100 per annum, with board, washing, and apartments.

UNIVERSITY OF SYDNEY, New South Wales.—Professor of Pathology. Salary £900 per annum. Pension £400 per annum after twenty years' service. £100 allowed for passage.

VICTORIA HOSPITAL, Folkestone.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

WEST BROMWICH UNION INFIRMARY.—Assistant Medical Officer. Salary £125 per annum, and £100 per annum in lieu of apartments, board, &c.

WEST HAM HOSPITAL, Stratford, E.—Junior House Surgeon. Salary £75 per annum, with board, residence, &c.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.—House Surgeon. Salary £120 per year, and £30 per year for Dispensing, with furnished apartments and attendance.

WORCESTER GENERAL INFIRMARY.—Assistant House Surgeon. Salary £70 per annum, with board, residence, and washing.

WORKSOP DISPENSARY AND VICTORIA HOSPITAL.—House Surgeon. Salary £150 per annum, with furnished rooms, coals, gas, and attendance.

The Chief Inspector of Factories gives notice of a vacancy as Certifying Surgeon under the Factory Acts at Flaxton, York.

Births, Marriages, and Deaths.

BIRTHS.

BENNETT.—On July 19th, at Vancouver-road, Forest-hill, S.E., the wife of Colin E. W. Bennett, L.R.C.P., M.R.C.S., of a son.

DUNLOP.—On July 18th, at Levenwick, Shetland, the wife of Alexander W. Dunlop, M.D. Glasg., of a daughter.

HAMERTON.—On July 13th, at Russell-square, W.C., the wife of George Albert Hamerton, F.R.C.S., of a daughter.

MERRY.—On July 21st, at Chiswick-place, Eastbourne, the wife of W. J. C. Merry, M.D. Oxon., of a son.

MARRIAGES.

FINCH—LOWE.—On the 17th, at the Ecclesfield parish church, by the Rev. G. P. Proctor, M.A., W. Stanley Finch, M.R.C.S., L.R.C.P., of Purston, Pontefract, to Sarah (Sallie), second daughter of Robert Lowe, Esq., of Shire-green, near Sheffield.

GERVIS—OLD.—On July 18th, at St. Augustine's Church, Kilburn, Arthur Frederick Gervis, M.R.C.S., L.R.C.P., to Ethel, eldest daughter of Charles Old of Brondesbury.

MISKIN—MISKIN.—On July 20th, at the parish church, Eltham, Kent, Ernest Miskin, M.B. Lond., M.R.C.S., L.R.C.P., to Mabel Caroline, only daughter of W. T. Miskin of Court Yard House, Eltham, Kent.

DEATHS.

BLAMPIED.—On June 29th, at Sandy Brooke, St. Peter's, Jersey, John William Blampied, L.S.A., M.R.C.S. Eng., L.M. Dubl

GORNALL.—On Thursday, July 18th, after a long and painful illness, John Hankinson Gornall, M.R.C.S., L.S.A., J.P., during 21 years Medical Officer of Health of the Borough of Warrington.

SHETTLE.—On July 21st, at Nailsworth, Gloucestershire, Richard Charles Shettle, M.D., aged 76, for 28 years Physician to the Royal Berkshire Hospital.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

MEDICAL REFEREES AND THEIR REPORTS: IMPORTANT DECISION OF THE HOME OFFICE.

AT the Southwark County Court on July 23rd, his Honour Judge Addison, K.C., said he desired to make public a matter which affected the practice of all county courts in regard to the Workmen's Compensation Act. A short time since Messrs. Barrow Bros. applied to terminate an award to an old man named Bowden under the Workmen's Compensation Act, alleging that he had quite recovered from the effects of the injury and was then suffering only from old age. The old man's medical attendant, however, gave it as his opinion that he was still suffering from the effects of the injury, and as there was this contradiction between the two medical men he (his Honour) referred the man and both reports to the medical referee appointed under the Act by the Home Office. Upon the medical referee's report he decided that the award should continue. After he had referred the case an application was made to him that the examination should be conducted in the presence of the solicitor to each party, but he refused it on the ground that the examination should be conducted privately and that if lawyers were allowed to attend the costs of the case would be piled up and the object of the Act would be defeated. Subsequently application was made by one of the parties for a copy of the medical referee's report, but he refused to grant it, merely stating that the substance of the report was in favour of the workman. It was then stated that a contrary practice prevailed at a county court for the proceedings and judge of which he had the greatest respect, but he refused to be guided by this because he thought that perhaps in the case quoted the judge in question had not considered the matter or had acted with the consent of each party. He, however, communicated with the Home Office in regard to the matter and he had now received a reply from that quarter stating that the authorities altogether approved of his decision that a medical referee was not to be attended by lawyers at all, but was to make his examination privately with the contradictory reports of the medical gentlemen in the case before him. As regarded the supplying of a copy of the report to the parties, the Home Office held that the report was primarily for the judge and he ought not to show it to anybody, but that he could use his discretion as to whether it would be right to show it to the parties should they ask to see it. He would use his discretion in the matter and would never reveal a report except under very exceptional circumstances, because he felt that a medical men who had to decide impartially between two other practitioners should not be exposed to the sort of controversy or contradiction that would result if those against whom he decided were allowed to criticise his report and to pull it to pieces. Further, he was of opinion that a medical referee would not report with the same fulness and confidence if his report was to be made a public document. Therefore he would follow the course which he had adopted and would refuse to allow any lawyers to attend the examination or to grant them copies of the referee's reports.

"ACME" PURE WOOL UNDERCLOTHING.

WE have received from Messrs. Charles Bayer and Co., of Victoria-buildings, Golden-lane, London, E.C., a specimen undergarment made of the above material. Both microscopical and chemical examination proved the fabric to be all pure wool, and macroscopical investigation showed the wool to be of a specially fine, soft, and elastic variety, of a net-like texture, permitting the free performance of the excretory function and at the same time protecting the body from cold. Owing to its extreme softness and lightness it is not oppressive or irritating to the skin. This material is particularly well adapted for clothing in cold, damp, and changeable climates.

THE TWO SIR MICHAEL FOSTERS.

SOME readers of the leading article on the Russell trial in the *Times* of Friday last, July 19th, may have confounded the Sir Michael Foster there referred to as an authority on State trials with the eminent member of our own profession of the same name. It may be well to explain that the authority referred to was Sir Michael Foster, a judge of the King's Bench, who lived in the latter part of the Stuart and early part of the Hanoverian periods, "a very great master of Crown law," according to Sir William Blackstone.

THE DUST NUISANCE.

PUBLIC attention is once more being directed to the intense nuisance caused by the conveyance of dust refuse through the streets in carts. The nuisance is only in part mitigated by the use of covered-in carts, for the dustman generally manages to shoot a load into the cart in such a way as to raise as big a cloud of dust as possible, and this is generally done at a time when the streets are most crowded. The bacteriology of dust is appalling and there is not the smallest doubt that dust is responsible not only for certain respiratory affections, inflamed eyes, but for other disturbances also such as, for example, headache. It is probable, moreover, that wood pavements contribute their quota of dust in the streets owing to the ease with which wood disintegrates. It is clear, however, that some people enjoy a special immunity from the mischievous and offensive properties of dust, and a better example of this class of person could not be found than in the innocent dustman himself. He will be found enjoying his meal by the roadside between his jobs or when his work is done smothered in dust, his bread-and-butter besmirched with it from his unwashed hands, and he can even be caught occasionally taking a piece of cinder out of his mouth, in spite of which dustmen appear to be by no means an unhealthy class. But the fact that he is "used to it," or immunised, so to speak, is no reason why others should be exposed to such possibilities as we have pointed out and that there be no complaining in our streets our authorities should give more attention to this matter. The nuisance is a very real one.

A POINT IN PUBLIC HEALTH.

To the Editors of THE LANCET.

SIRS,—I should be glad of a reply to the following. The occupants of the dwelling-house in connexion with railway-station refreshment-rooms are suffering from the effects of defective drainage. Has the sanitary authority of the urban council the same power to deal with this as they would with any other insanitary property?

I am, Sirs, yours faithfully,

July 23rd, 1901. VERITAS.

*** We know of no provision which in this case would bar a district council from adopting the ordinary procedure to abate nuisances, such as defective drains, in connexion with a dwelling. Our correspondent probably has in mind the exemptions from the operations of by-laws which have been allowed to railway companies in the case of buildings used for the purposes of the railway (Public Health Act, 1875, Sec. 157).—ED. L.

LOCUM-TENENTS.

To the Editors of THE LANCET.

SIRS,—Will you allow me through THE LANCET to give those requiring the services of a locum-tenent a profitable hint? I at one time never made arrangements with the agents except by wire, giving only very short notice when I required a man, &c. I have lately found that good and reliable men will not accept engagements at short notice—i.e., by wire. They like to know where they are going and to have some knowledge of the practice and principal. By giving an agent sufficient notice I have had first-rate men. Of course the ne'er-do-well who spends his money as soon as, or perhaps before, he earns it, does not care where he goes or how he does his work, but the better class of men like a few days' rest between each post. My last locum, an F.R.C.S. Eng., said he never took any notice of the agent's wires and preferred to enter into an arrangement by advertisement. Trusting this hint may be of use, I am, Sirs, yours faithfully,

July 22nd, 1901. M.D. BRUX.

A WARNING.

To the Editors of THE LANCET.

SIRS,—A large number of members of our profession have been receiving begging letters from a man signing himself "W. Dyer Frazer," pleading want of means consequent on illness and loss of income owing to the situation in South Africa. The only W. Dyer Frazer in the profession is at the present moment in South Africa and is not in need of pecuniary assistance. The police have been communicated with and a warrant has been issued. The writer has at present disappeared, but the police consider that he is probably writing more letters from a different address and over a different signature. Would, therefore, anyone who receives a begging letter, however signed, the *bona fides* of which is in question, kindly forward it to me or to Detective-Sergeant Harris, Marylebone Police-station, W.

I am, Sirs, yours faithfully,

31, Welbeck-street, W., July 22nd, 1901. HERBERT C. CROUCH.

"EXPENSES AT CARLSBAD AND HOMBURG."

To the Editors of THE LANCET

SIRS,—In reply to the inquiry in THE LANCET of July 13th, p. 116, the following facts may be useful. I lived at Homburg in 1894 from August 15th to Sept. 3rd, as a bachelor, and paid for lodging from 11*s.* 6*d.* to 12*s.* 6*d.* per week, which included a meagre breakfast, and I got a good dinner every day at a restaurant for 2*s.* 2*d.* per day. As a stranger I had also to pay a tax of 16*s.* I do not know whether this inhospitable law is still in force. The tax admits you to the use of the Kurhaus, with its reading-rooms, newspapers, and gardens, and good music two or three times a day, all gratis.

I am, Sirs, yours faithfully,

July 22nd, 1901. G.

*** A medical man is, we believe, exempt from the Kurtax.—ED. L.

THE HOT-AIR BATH.

To the Editors of THE LANCET.

SIRS,—There is much talk about cooling drinks, light clothing, &c., but the one real "cooler" is seldom mentioned. Every year I live I am more and more astounded at the attitude shown by the profession—teachers of healthy living—towards the hot-air, or so-called Turkish, bath. As far as I can judge not more than 10 per cent. of the profession are regular bathers; about 40 per cent. may have once had a bath,

and 50 per cent. take a positively hostile attitude—fear "catching cold" after, or being "weakened" by the process—simple delusions.

I am not referring to the hot-air bath as a remedy but as a luxury in health or as a preserver of health. As an old bather I have for years debated in my own mind whether the thorough "cooler" one gets by the process in weather like the present, or the real lasting "warm through" in bitterly cold weather is the more enjoyable, and I cannot make up my mind. "But I can't spare the time," most people say. One hour in winter-time and one and a quarter hours in summer is ample if you know how to bathe. Expense—well, at one of the most capacious and well-ventilated baths in London—Caledonian-road, close to King's Cross Metropolitan Station—10 tickets can be got for 10s., and "number one" shampooer is one of the best I have ever met with. As a "nerve tonic"—but there, the subject is an immense one, and it is as regards the one really scientific "cooler" that I venture just now to bring forward the matter.—I am, Sirs, yours faithfully,

July 20th, 1901. F. ORTON, M.D. Dub.

W.—1. We cannot attempt to answer the first part of our correspondent's question. 2. Either the Berkefeld or the Pasteur Chamberland filters may be used.

Tabloid.—So far as we know there is nothing illegal in the custom, but it is unnecessary. The examinations for the triple qualification include one in midwifery.

Dr. W. E. F. Tinley.—1. The London Hospital has an installation for the purpose. 2. Our correspondent should write to Mr. Malcolm Morris.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 25th, 1901.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
July 19	30·10	ENE	...	122	90	63	67	73	Hazy
,, 20	30·08	E.	...	127	88	65	66	74	Fine
,, 21	29·97	E.	...	125	87	63	61	69	Fine
,, 22	29·83	N.W.	...	124	77	65	64	68	Cloudy
,, 23	29·81	N.W.	...	89	67	58	58	60	Raining
,, 24	29·56	S.	0·04	107	68	58	59	62	Overcast
,, 25	29·52	S.E.	0·37	107	72	58	59	63	Cloudy

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (29th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M.).

TUESDAY (30th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Royal Ear (3 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

WEDNESDAY (31st).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.).

THURSDAY (1st).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), St. Mark's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

FRIDAY (2nd).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

SATURDAY (3rd).—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), London Throat (2 P.M.), Throat, Golden-square (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

BRITISH MEDICAL ASSOCIATION MEETING AT CHELTENHAM.

DURING the forthcoming meeting of the British Medical Association at Cheltenham the representatives of THE LANCET can be consulted at the Queen's Hotel with regard to our reports of papers and proceedings.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1901, which was completed with the issue of June 29th, and the Title-page to the Volume, were given in THE LANCET of July 6th.

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VOLUMES for the first half of the year 1901 are now ready. Bound in cloth, gilt lettered, price 12*s.*, carriage extra.

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During the week marked copies of the following newspapers have been received:—*Liverpool Daily Post, Leeds Mercury, Yorkshire Post, Hertfordshire Mercury and County Press, Mining Journal, Local Government Chronicle, Reading Mercury, Windsor and Eton Express, South African News, Surrey Advertiser, Local Government Journal, Bristol Mercury, Aberdeen Journal, Aberdeen Weekly Free Press, &c.*

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